

Course Description Form

1. Course Name:	
Soil physics	
2. Course Code:	
AGSW24-F3011	
3. Semester / Year:	
First semester / 2025 – 2026	
4. Description Preparation Date:	
1 \ 9 \ 2025	
5. Available Attendance Forms:	
presence and electronic	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 Theoretical 3 practical/ 4 unite	
7. Course administrator's name (mention all, if more than one name)	
Name: mooatasim daood S.Agha Email: mooatasim@uomosul.edu.iq Noor jamal Hussien Email :noorjamalalmola@uomosul.edu.iq	
8. Course Objectives	
1- - Giving academic lectures based on scientific concepts and principles to understand the physical properties of the soil, maintain good soil properties and increase soil moisture retention. 2- Preparing agricultural engineers capable of making optimal use of soil irrigation water to enter the agricultural sector with outstanding efficiency.	1- Guiding students towards the desire to gain better experience with applying for graduate studies.
9. Teaching and Learning Strategies	
Theoretical: - Interactive lecture - Brainstorming - Dialogue and discussion - Task assignment and report - Presentations of irrigation and drainage network models	Practical: - Assigning group work to uncover leadership skills - Assigning tasks and a report for each experiment - Assigning the student to prepare a report titled "From His Diligence" and presenting it for discussion with the students

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 practical	Theoretical: a1. The student will learn the concept of irrigation and its mathematical relationships. Practical: a1. The student will learn the concept of irrigation and its mathematical relationships.	Theoretical: Mathematical Relationships Practical: Mathematical Relationships for Soil Components and Equivalent Depth of Soil Water	Theoretical: Auditory Methods Writing on the Board Direct Dialogue Method Practical: Adapting Tasks and Reports	Short exams, assignments, discussions
2	2 Theoretical 3 practical	Theoretical: a1 The student recognizes the concept of equivalent depth and its importance. Practical: a1 The student recognizes the concept of equivalent depth and its importance.	Theoretical: Equivalent Depth: Derivations with Problem Solving Practical: Methods for Measuring Soil Moisture	Theoretical: Auditory Methods Writing on the Board Direct Dialogue Method Practical: Adapting Tasks and Reports	Short exams, assignments, discussions
3	2 Theoretical 3 practical	Theory a1- The student will understand the concepts of water movement, field capacity measurement, and permanent wilting point. Practical a1- The student will understand the concepts of water movement, field capacity measurement, permanent wilting point..	Theoretical: Physical concepts of motion and their laws Practical: Measuring field amplitude and the permanent wilting point	Theoretical: Auditory Methods Writing on the Board Direct Dialogue Method Practical: Adapting Tasks and Reports	Short exams, assignments, discussions
4	2 Theoretical 3 practical	Theory: -a1 Describes to the student the estimation of soil texture using the hydrometer method. Practical: -a1 Describes to the student the estimation of soil texture using the hydrometer method.	Theoretical: Soil Texture Estimation – Hydrometer Method Practical: Applications of Texture Analysis – Solving Mathematical Problems on Texture Using the Hydrometer Method	Theoretical: Auditory Methods Writing on the Board Direct Dialogue Method Practical: Adapting Tasks and Reports	Short exams, assignments, discussions
5	2 Theoretical 3 practical	. Theory: - a1. The student describes estimation of soil texture using the absorbent method. Practical: - a1. The student describes estimation of soil texture using the absorbent method.	Theoretical: Soil Texture Estimation – The Pipette Method Practical: Applications of Texture Analysis – Solving Mathematical Problems on Texture Using Pipette Method	Theoretical: Auditory Methods Writing on the Board Direct Dialogue Method Practical: Adapting Tasks and Reports	Short exams, assignments, discussions

Course Description Form

1. Course Name:	
Organic Matter in the soil	
2. Course Code:	
AGSW24_F3024	
3. Semester / Year:	
First fall semester / 2025–2026	
4. Description Preparation Date:	
1\ 9 \ 2025	
5. Available Attendance Forms:	
My presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical + 3 practical / 4 units	
7. Course administrator's name (mention all, if more than one name)	
Name: M.Dr. Hesham Saadaldeen Yunis Name: A. L. Marwan Mahmoud yassen	
8. Course Objectives	
theoretical 1- Enabling the student to know the organic matter in the soil 2- Identify the phenotypic characteristics of organisms in the soil 3- Identify how organic matter is transformed into humus in soil 4- Introducing the student to the characteristics of organic matter in the soil 5- Trying to enhance the student's skills in diagnosing and calculating each other Chemical equations	Practical Enabling the student to have the ability to analyze Organic matter and enzyme determination And conduct practical experiments to detect some sugars
9. Teaching and Learning Strategies	
Theoretical - Interactive lecture - Brainstorming - Dialogue and discussion - Assigning reports - Conducting monthly and daily examinations	Practical Interactive lecture –Discussion, dialogue, brainstorming –Conducting laboratory experiments –Assigning reports – Conducting daily and monthly examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 practical	Theoretical The student demonstrates a concept organic matter From the soil Practical The student gets to know the material organic matter and its decomposition in soil	Theoretical Organic matter in soil, its definition and sources Practical Decomposition of organic matter in soil	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
2	2 Theoretical 3 practical	Theoretical The student explains the most important Components of plant waste Practical The student reveals the origin and method you analyze it	Theoretical Components of plant waste Practical Hydrolysis of starch	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
3	2 Theoretical 3 practical	Theoretical Identify organic compounds Practical The student can detect Liquefy the gelatin	Theoretical Simple organic compounds resulting from the decomposition of organic matter Practical Detection of gelatin liquefaction	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
4	2 Theoretical 3 practical	Theoretical The student learns about the carbon cycle and enzymatic activity in the soil Practical The student detects the breakdown of fats	Theoretical Organic matter: carbon cycle, enzymatic activity in soil Practical Lipolysis	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
5	2 Theoretical 3 practical	Theoretical Recognize transformations Nitrogen bioavailability and microorganisms that decompose it Urea Practical The student will be able to decompose organic acids	Theoretical Biological transformations of nitrogen: nitrogen cycle, urea hydrolysis, nitrification process Practical Hydrolysis of amino acids	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
6	2 Theoretical 3 practical	Theoretical The student explains how it is done Mineralization and nitrogen assimilation Practical The student learns how Determination of cellulase enzyme in soil	Theoretical Biological nitrogen fixation Practical Cellulose hydrolyzes aerobically and anaerobically	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
7	2 Theoretical 3 practical	Theoretical The student is aware of the importance of nitrogen-fixing microorganisms	Theoretical Biotransformations of phosphorus: its cycle and the role of microorganisms in its transformations	theoretical audio methods, Writing on the board direct dialogue style	Short exams, assignments, discussions

		Practical The student detects the decomposition of cellulose	Practical Determination of phosphatase enzyme in soil	practical Assigning tasks and reports	
8	2 Theoretical 3 practical	Theoretical The student judges the role Microorganisms that convert phosphorus Practical The student is able to estimate the enzyme phosphatase in soil	Theoretical Biotransformations of sulfur: a role Sulfur, its mineralization, representation Microbial, oxidative stress Practical Quantification of fungal growth	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
9	2 Theoretical 3 practical	Theoretical The student learns about the role Microorganisms that transform sulfur Practical The student can measure the amount of fungal growth	Theoretical Reduction of inorganic sulfur compounds Practical Sulfur transformations Biology	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
10	2 Theoretical 3 practical	Theoretical Determine which student you are doing By reducing sulfur compounds Inorganicity Practical The student will be able to estimate sulfur biologically	Theoretical Biotransformations of iron: oxidation and reduction, decomposition of iron compounds Membership Practical Estimation of urease enzyme	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
11	2 Theoretical 3 practical	Theoretical The student learns about the role Microorganisms that transform iron Practical The student will be able to estimate the urease enzyme in the soil	Theoretical Decomposition of pesticides in soil Practical Estimation of catalase enzyme	theoretical audio methods, Writing on the board direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
12	2 Theoretical 3 practical	Theoretical The student is familiar with the role of microorganisms in the decomposition of pesticides Practical The student is able to estimate the catalase enzyme in soil	Theoretical The student is familiar with the role of microorganisms in the decomposition of pesticides Practical The student is able to estimate the catalase enzyme in soil	theoretical audio methods, Writing on the board Direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
13	2 Theoretical 3 practical	Theoretical The student explains the relationship between microorganisms Practical The student reveals the total reducing sugars	Theoretical The student explains the relationship between microorganisms Practical The student reveals the total reducing sugars	theoretical audio methods, Writing on the board Direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions
14	2 Theoretical 3 practical	Theoretical The student learns about an Activity Microbiology in the area near the roots Which is known as the rhizosphere Practical The student reveals an ability Bacteria to perform transformations Nitrogenism	Theoretical The student learns about an activity microbiology in The area near the roots Which is known as the rhizosphere Practical The student reveals an ability	theoretical audio methods, Writing on the board Direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions

			Bacteria to perform transformations Nitrogenism		
15	2 Theoretical 3 practical	Theoretical The student learns about the most important... Factors affecting growth Microbiology Practical The student reveals the ability of bacteria to carry out phosphate transformations	Theoretical The student learns about the most important... factors affecting growth microbiology Practical The student reveals the ability of bacteria to carry out phosphate transformations	theoretical audio methods, Writing on the board Direct dialogue style practical Assigning tasks and reports	Short exams, assignments, discussions

11. Course Evaluation

	Evaluation	Time of evaluation	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 (methodology, if any)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports....)	
Electronic references, Internet sites	



M.Dr. Hesham Saadaldeen Yunis
Theoretical subject teacher:



Assist. Lecturer Marwan Mahmoud yassen
Practical subject teacher



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



Dr. Abdul Qader Abash
Chair of the Scientific Committee

Course Description Form

1. Course Name:	Soil fertility
2. Course Code:	SOFE348
3. Semester / Year:	The first / Autumn semester / 2025-2026
4. Description Preparation Date:	1 / 9 / 2025
5. Available Attendance Forms:	In presence
6. Number of Credit Hours / Number of Units /	2 theoretical + 3 Practical / units / 3
7. Course administrator's name (mention all, if more than one name)	Name: Dr. ammar younis kashmolah Email: ammaryajk60@uomosul.edu.iq Assist. Lecturer: Marwan Mahmoud yassen
8. Course Objectives	• The student learns about the methods of taking soil samples and preparing them for chemical analysis and soil fertility evaluation. • Enable the student to know the concepts of soil fertility and how to evaluate soil fertility and prepare fertilizer recommendation. • Introducing the student to the methods of detecting different fertilizers and calculating the quantities of added fertilizers and the method and time of their addition. • Introduce the student to the different physiological functions of these elements and their role in plant growth. • Enable the student to identify the sources and images of nutrients and the factors that affect their availability. • Introducing the student to the most important methods of measuring nutrient concentrations in the soil. • Enable the student to diagnose the symptoms of nutrient deficiency and treat them in the appropriate way and time.
9. Teaching and Learning Strategies	

- Interactive Lecture
- Brainstorming
- Dialogue and discussion
- Field Training
- Practical exercises
- Field Project
- Self-learning

10. Course Structure

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	The week
Semester Exam 1, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning.	Introduction to the importance of soil fertility, general definitions, the origin and development of science	A1: The student gets to know the importance of soil fertility ,the emergence of soil fertility science and its development	2 Theoretical	1
Practical quiz ,1	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	nitrogen fertilizers, standard specifications, detection of fertilizer, determination of N percentage in manure	B3: The student learns how to detection of urea and ammonium sulfate and estimation of N percentage in fertilizers and their conformity for standard specifications	3 Practical	
Semester Exam 1, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning.	Growth and the factors affecting it.	A2: The student learns about growth how to measure it and factors affecting him	2 Theoretical	2
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	phosphate fertilizers, standard specifications, Detection, determination of P ratio in fertilizers	B4: The student can detection Superphosphate and estimation of P the percentage in the fertilizer and its conformity for standard specifications	3 Practical	
Semester Exam 1, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quantitative relationships between plant and nutrients. The equations of Mecherlich and Powell. and Bray's theory for the movement of elements	C1: The student is able to express about plant growth Using growth equations different depending on Nutrient determinant for growth	2 Theoretical	3
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Potash fertilizers, standard specifications, Detection, determination of K-percentage in fertilizer	B5: The student can fertilizers detection Potash and Appreciation K ratio in fertilizers and its conformity for standard specifications	3 Practical	
Semester Exam1, Final Exam, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Preliminary foundations and concepts in soil fertility Fertilization, a soil medium for plant growth, qualities Soil and its relationship to nutrient availability, the concept of nutrient availability and divisions Nutrients	C2: The student recognizes the impact of pH and soil exchange capacity on the nutrient availability	2 Theoretical	4
Practical quiz ,2	Interactive lecture, brainstorming, dialogue and	Taking soil samples from the field and preparing for chemical analysis	B4: The student gets to Know methods of taking the sample and preparing it for chemical analysis	3 Practical	

	discussion, field training, Practical exercises, self-learning				
Semester Exam1, Final Exam, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Nitrogen, its importance for the plant, nitrogen in Soil, nitrogen mineralization, influencing factors, symptoms of nitrogen deficiency.	A3: The student gets to know the importance of nitrogen and the way it is absorbed and the symptoms of its deficiency and methods Processed and the most important Nitrogen fertilizers	2 Theoretical	5
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Extraction and determination of available nitrogen in the soil	C4: Familiarizes the student extraction and estimation Nitrogen in a way Kjeldal and how to calculate concentration in different units	3 Practical	
Quiz 1, Final Quiz	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Phosphorus - its importance to the plant and its transformations, factors affecting the conservation phosphorus in the soil, symptoms of phosphorus deficiency	A4: The student gets to know the importance of phosphorus and the way it is absorbed and its transformations within the plant and the symptoms of its deficiency and methods Processed and the most important Phosphate fertilizers	2 Theoretical	6
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Extraction and determination of available phosphorus in the Soil	C6: Familiarizes the student in ways extraction and estimation method available phosphorus and how to calculate conc. in different units	3 Practical	
Semester Exam 2, Final Exam, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Potassium, its importance for the plant, and its transformations, factors affecting it, symptoms of potassium deficiency Potassium fertilizers	A5: The student knows the importance of potassium and the way it is absorbed and its transformations within the plant, the symptoms of its deficiency and methods Processed	2 Theoretical	7
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, field project, self-learning	Extraction and determination of available potassium in the soil	C7: Familiarizes the student in ways extraction and estimation method available potassium and how to calculations in different units	3 Practical	
Semester Exam 2, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Calcium, importance of calcium for plants, factors affecting calcium, symptoms deficiency, calcium fertilizers	A6: The student gets to know the importance of calcium and the way it is absorbed, the symptoms of its deficiency and methods Processed and the most important Calcium fertilizers	2 Theoretical	8
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Extraction and determination of soluble calcium in soil	C8: The student can estimate soluble calcium with chelating substance	3 Practical	

Semester Exam 2, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Magnesium, the importance of magnesium for the plant, factors Affecting, Symptoms Deficiency, fertilizers	A7: The student gets to know the importance of magnesium and the way it is absorbed, the symptoms of its deficiency, methods Processed and the most important Magnesium fertilizers	2 Theoretical	9
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Extraction and determination of magnesium dissolved in soil	C8: The student can estimate Magnesium with chelating substance	3 Practical	
Semester Exam 2	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Sulfur, the importance of sulfur for plants, cycle sulfur in the soil, sulfur sources, Symptoms of sulfur deficiency, sulfur fertilizers	A8: The student knows the importance of sulfur and the way it is absorbed and the symptoms of its deficiency and methods Processed and the most important sulfur fertilizers	2 Theoretical	10
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Extraction and determination of available sulfur in the soil	C9: The student knows the method of appreciation available sulfur in a way Turbidity and how to calculate Conc. in different units	3 Practical	
Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Microelements, iron, zinc, copper, Its importance to the plant, and the symptoms of its deficiency.	A9: The student gets to know the importance of Al-micro nutrient and the symptoms of its deficiency and methods Processed and the most important Fertilizers of micro elements.	2 Theoretical	11
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	extracting and estimating micro elemental cations - in the soil	C10: The student can estimate micro-Element	3 Practical	
Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Microelements, manganese and boron and molybdenum, its importance for the plant , the symptoms of its deficiency on the plant	A10: The student gets to know the importance of manganese, boron, molybdenum and Symptoms deficiency and its most important fertilizers	2 Theoretical	12
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Extraction and determination of available boron in the soil by hot water method	C11: The student can estimate Boron using Chromatography method	3 Practical	
Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Organic matter in the soil	C3: The student learns about the importance of organic matter for soil and plants and the factors affecting their decomposition	2 Theoretical	13
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical	Measurement of soil organic matter and calculation of C N	B7: The student gets to know the importance of organic matter For soil, plant and Factors affecting its decomposition	3 Practical	

	exercises, self-learning				
Quiz 2, Final Quiz, Report	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	The student is familiar with the types of aquaculture farms, their design methods, their advantages and disadvantages	B1: The student learns about hydroponic farms	2 Theoretical	14
Practical quiz3	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Preparing nutritional solutions In hydroponic farms	B8: The student can prepare Nutrient solution	3 Practical	
Quiz 3, Final Quiz	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Soil Fertility Assessment	B2: The student is familiar with the methods of evaluation soil	2 Theoretical	15
Homework	Interactive lecture, brainstorming, dialogue and discussion, field training, Practical exercises, self-learning	Soil fertility assessment by its general characteristics	B9: Enabling the student to judge on soil fertility during its general properties	3 Practical	

11.Course Evaluation

Seq.	Evaluation methods	Evaluation date (one week)	degree	Relative weight %
1	Report 1	Fourth week	2.5	2.5
2	Report 2	Fifth week	2.5	2.5
3	Quiz (1)	Sixth week	2	2
4	Quiz (2)	Fourteenth week	2	2
5	Quiz (3)	Fifteenth week	1	1
6	Semester Exam (1)	Sixth week	7.5	7.5
7	Semester Exam (2)	The first week is difficult	7.5	7.5
8	Final theoretical test	Final Semester Exams	40	40
9	Report3	seven Week	5	5
10	Report4	Fourteenth week	2	2
11	Practical Quiz (1)	First week	1	1
12	Practical Quiz (2) Quiz	Fourth week	0.5	0.5
13	Practical Quiz (3) Quiz	Fourteenth week	1	1
14	and homework	weeks 14,13,12,11,10,9,8,7,6,5,3	5.5	5.5
15	Final Practical Test	Final Semester Exams	20	20
	Total	100	100 %	%100

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	Fertilizers and soil fertility - Dr. Saad Allah Al-Nuaimi
Main references (sources)	Soil fertility and fertilization-d.Kazem Mashhoot Awad
Recommended books and references (scientific journals, reports...)	Fertilizer technologies and their uses - dr. Noured Shawky Ali Plant physiology. Doctor Abdul azim Kazem
Electronic References, Websites	FAO



Theoretical subject lecturer:
Dr. Ammar Younis Kashmoula



Chairman of the Scientific Committee:
Dr. Abdulqader Abash Sbak



Practical subject lecturer:
Assist. Lecturer Marwa Mahmoud yassen



**Head of the Department of Soil Science
and Water Resources:**
Dr. Khalid Anwar Khalid

Course Description Form

1. Course Name :	
Irrigation	
2. Course Code:	
IRIG349	
3. Semester / Year:	
First semester 52025/2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
In presence + electronic	
6. Number of Credit Hours (Total) / Number of Units (Total) :	
2 Theoretical +3 Practical / 4 Unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Faris Akram Salih Al-Wazzan Nour Jamal Hussein	
8. Course Objectives	
Course Objectives	1– Preparing students who have the ability to use modern irrigation methods and describe these methods accurately with the possibility of using them within Iraqi soils, which represent calcareous soils... and integrating these methods with drainage networks disposal of excess water..... 2– Entering the agricultural sector with distinguished efficiency through participation in irrigation projects, modern irrigation techniques, and the use of the best methods in order to reduce water use within agricultural lands and reduce the risk of salt and desert.. 3– Directing students towards a desire to obtain better experiences when applying postgraduate studies..
1. Teaching and Learning Strategies	
Theoretical: -Interactive lecture -Brainstorming -Dialogue and discussion -Assigning tasks and reporting -Presentations of models of irrigation and drainage networks	Practical: - Assigning group work to reveal leadership skills - Assigning tasks and reporting for each experiment - He is assigned to prepare a report entitled from his own diligence and prepare it for discussion with Students

2. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 Practical	Theoretical: Explains the concept to the student Irrigation and relationships mathematical practical : Empowering the student to solve Equations	Theoretical: The concept of irrigation and the introduction to irrigation with mathematical relationships between the size and mass of soil components practical : Mathematical relationships for soil components and the equivalent depth of soil water	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
	2 Theoretical 3 Practical	theoretical: Explains depth to the student The equivalent and its importance practical : Explains to the student Fundamentals of humidity measurement	theoretical: Equivalent depth derivations with solving mathematical problems practical : Methods for measuring soil moisture	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
	2 Theoretical 3 Practical	Theoretical: Explains the concepts of movement to the student practical : Shows the student the measurement Field capacity And the wilting point	theoretical: Physical concepts of motion and its laws practical : Measuring field capacity and permanent wilting point	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
	2 Theoretical 3 Practical	Theoretical: Explains to the student Types of pumps agricultura practical :	Theoretical: Choosing the type of pump with examples practical :	theoretical: Audio methods style Writing on the board Direct dialogue style practical :	Conduct daily examinations. Assignment discussions

		Explains measurement methods using multiple methods	Methods for measuring irrigation water discharge	Adapt tasks and reports	
5	2 Theoretical 3 Practical	Theoretical: Enabling the student to Irrigation water evaluation practical : Shows mathematical applications weirs	Theoretical: Evaluation of irrigation water quality practical : Irrigation canal design	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
6	2 Theoretical 3 Practical	Theoretical: Shows the student importance Irrigation efficiencies practical : Empowering understanding competencies Irrigation	Theoretical: Irrigation efficiencies with example practical : Types of irrigation efficiencies with solutions and examples	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
7	2 Theoretical 3 Practical	Theoretical: Enabling the student Understanding evaporation transpiration practical : Explains method measuring Water consumption	Theoretical: evaporation and transpiration practical : Water requirements measurements	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
8	2 Theoretical 3 Practical	Theoretical: Explains to student importance irrigation scheduling	Theoretical: Irrigation scheduling	theoretical: Audio methods style Writing on the board	Conduct daily examinations. Assignment discussions

9	2 Theoretical 3 Practical	practical : Explains the basics of irrigation scheduling Theoretical: Shows the student importance Water requirement of crop practical : Empower student to Calculate the plant's water requirement water	practical : Methods of scheduling irrigation with solutions and examples Theoretical: Water requirement of the crop practical : Calculate water requirements and solve examples	Direct dialogue style practical : Adapt tasks and reports theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
10	2 Theoretical 3 Practical	Theoretical: The student can Knowledge of irrigation cycle practical : Explains to student calculation of period between ritual and another	Theoretical: Irrigation frequency Irrigation cycle practical : Calculating irrigation quantities and irrigation cycle	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
11	2 Theoretical 3 Practical 2 Theoretical 3 Practical	Theoretical: The student shows how Water entry into the soil practical : Shows the student methods Instantaneous Infiltration measurement	Theoretical: Water Infiltration practical : Infiltration measurement	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
12	2 Theoretical 3 Practical	Theoretical: Explains importance irrigation Surface practical :	Theoretical: Surface irrigation methods practical :	theoretical: Audio methods style Writing on the board	Conduct daily

13	2 Theoretical 3 Practical	Shows irrigation methods Theoretical: Shows sprinkler irrigation systems practical : Explains strip irrigation systems	Surface and subsurface irrigation Theoretical: Strip irrigation practical : Arrangement of strip irrigation and its types	Direct dialogue style practical : Adapt tasks and reports theoretical: Audio methods style Writing on the board Direct dialogue style	examinations. Assignment discussions Conduct daily examinations. Assignment discussions
14	2 Theoretical 3 Practical	Theoretical: Shows Sprinkler Irrigation practical : Explains sprinkler irrigation system	theoretical: Basin irrigation and sprinkler irrigation practical : Arrangement and types of sprinklers	practical : Adapt tasks and reports theoretical: Audio methods style Writing on the board Direct dialogue style	Conduct daily examinations. Assignment discussions
15	2 Theoretical 3 Practical	theoretical: Explains drip irrigation systems practical: Shows drip irrigation systems	Theoretical: Drip irrigation practical : Arrangement of drippers and their mechanism of operatio	practical : Adapt tasks and reports theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment discussions
3. Course evaluation					

Relative weight %	Degree	Calendar appointment (weekly)	Calendar methods	ت
13%	7 Theoretical + 6 practical	Theoretically week (15) Practically week 1-15	Theoretical final report + practical experience reports	1
6 %	4+ Theoretical 2 practical	week (3)	Quiz(1)	2
15%	10 Theoretical+ 5 practical	week (9)	Exam Midterm (Theoretical and practical)	3
6%	4 + Theoretical 2 practical	week (12)	Quiz(2)	4
20%	20	Practical exam week	Final practical test	5
40%	40	Theory exam week	Final theoretical test	6
100%	100		Total	

4. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Irrigation... Dr. Issam Khudair Al-Hadithi
Main references (sources)	Irrigation and drainage book by Dr. Laith K
Recommended books and references (scientific journals, reports...)	SSSJ , WATER J .
Electronic References, Websites	https://doi.org/10.2136/sssabookser5.1.2ed

Dr. Faris akram salih Al-Wazzan

Theoretical teacher

Nour Jamal Hussein

Practical teacher

Abdul Qadir Abash Al-Hadidi
Head of the scientific committee

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

Course Description/ The relationship of soil, water and plant

1. Course Name:					
The relationship of soil, water and plant					
2. Course Code:					
SWPR451					
3. Semester / Year:					
first semester –fall- fourth stage -2025-2026					
4. Description Preparation Date:					
1\ 9 \ 2025					
5. Available Attendance Forms:					
Compulsory + electronic					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical + 3 practical / 4 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Assist. Pro. Fatih Abid Hassan					
Name: Assist. Lecturer. Alia Abdul Latif Jassim					
8. Course Objectives					
-Introducing the student to the chemical and physical properties of soil and water and their role in plant growth and sustainability. - Enabling the student to understand the properties of water, water potential, and its relationships with soil and plants. - Enhancing the student's ability to recognize the importance of organic matter and soil microorganisms and their relationship to soil sustainability and plant growth. - Enabling the student to understand how to manage problems associated with calcareous, saline, and sandy soils and to propose appropriate solutions. - Introducing the student to the effects of drought and methods to mitigate these effects on the environment and plant growth. - Enabling the student to become familiar with methods for measuring water potential in soil and plants. - Introducing the student to the main methods for measuring transpiration and leaf area.					
9. Teaching and Learning Strategies					
- Interactive Lecture - Brainstorming - Dialogue and discussion - Field Training - Practical exercises - Field Project - Self-learning					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2 Theoretical	a2: Introducing the student to the nature of the processes and factors involved in soil formation and development.	Soil- formation and nature	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Homework
	3 practical	a2: The student recognizes the effect of soil texture on the nature of root growth, including their depth and spread).	Comparison of the growth and development of root systems in different soils texture.	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Practical short test Quiz (1)
2	2 Theoretical	a2: The student becomes familiar with the effect of soil depth on plant growth, the causes of hardpan (compacted layer) formation in soil and methods for its treatment	Physical Properties of Soil – Soil Depth and Its Relationship to Plant Growth	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Homework
	3 practical	b3: <i>The student identifies how to separate the components of soil.</i>	Conducting a texture analysis experiment using the hydrometer	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Homework
3	2 Theoretical	a2: The student identifies the types of soil textures, the factors affecting them, and the effect of texture on plant growth	Physical Properties of Soil – Soil Texture and Its Relationship with Plant Growth	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Short test
	3 practical	a2: The student recognizes the effect of bulk density on the nature of root growth	The experiment on the effect of soil bulk density and compaction on root growth	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Homework
4	2 Theoretical	a2: The student becomes familiar with the types of soil structure and its effect on plant growth	Physical Properties of Soil – Soil structure and Its Relation to Plant Growth	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Report 1
	3 practical	b3: Enabling the student to conduct experiments to calculate the seed germination rate	The physiological effect of salt and their impact on soil properties and seed growth	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Practical short Quiz (2)
5	2 Theoretical	a2: The student recognizes the effect of soil air on plant growth and the relationship between soil air and soil water	Physical properties of soil (soil air) and their effect on plant growth	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Report 2
	3 practical	c1: The student calculates the moisture content in soil and plants	Experiment for estimating moisture content.	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
6	2 Theoretical	c1: The student lists the factors affecting soil temperature and explains how soil temperature influences plant growth	The physical properties of soil (soil temperature) and its effect on plant growth.	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Semester test 1
	3 practical	c1: The student calculates the amount of water lost through transpiration using different methods.	Methods of Measuring Transpiration in Plants	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
7	2 Theoretical	a2: The student gets to know the importance of nitrogen , the way it is absorbed and its transformation within the plant , the symptoms of deficiency and methods addressed	Nitrogen in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Report 3
	3 practical	b4: The student experiences the stages of nitrogen determination	Determination of Total Nitrogen in Plant Samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework

		using the Kjeldahl method and how to calculate concentration in plant			
8	2 Theoretical	a2:The student gets to know the importance of phosphorus , the way it is absorbed , its transformations within the plant and the symptoms of its deficiency	phosphorus in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Short test Quiz (1)
	3 practical	b4: The student experiences the estimation of phosphorus using the colorimetric method and how to calculate the concentration in different units	Determination of phosphorus in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
9	2 Theoretical	a2: The student gets to know the importance of Potassium and the way it is absorbed , the symptoms its deficiency , methods Processed and the most important Potassium fertilizers	Potassium in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Short test
	3 practical	b4:The student can estimate Potassium using a flame device and how to calculate the concentration In different units	Determination of potassium in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
10	2 Theoretical	a2:The student can recognize on the importance of calcium , the way it is absorbed , its transformations within the plant and the symptoms of its deficiency and methods addressed	Calcium in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
	3 practical	b4:The student can estimate calcium using chelating substances and how to calculate the concentration In different units	Determination of calcium in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
11	2 Theoretical	a2:The student can recognize on the importance of magnesium, the way it is absorbed , its transformations within the plant , t symptoms of its deficiency	Magnesium in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Semester Exam2
	3 practical	b4:The student can estimate magnesium using chelating substances	Determination of magnesium in plants	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
12	2 Theoretical	a2:The student gets to know the importance of sulfur , the way it is absorbed , its transformations and symptoms of its deficiency	Sulfur in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Short test
	3 practical	b4:The student can estimate Sulfur using turbidity method	Determination of sulfur in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
13	2 Theoretical	a2: The student can recognize on the importance of both Iron and	iron and zinc in plant	Interactive lecture, brainstorming, dialogue and discussion, field	Report 4

		zinc , method absorption, transformation within plant and symptoms of deficiency		training, self-learning	
	3 practical	b4:The student can estimate iron by the color method	Determination of iron in plant by the chromatography method	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
14	2 Theoretical	a2:The student can recognize on the importance of both manganese ,copper, method Absorption and transformation and symptoms of deficiency	manganese and copper in plant	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test Quiz (2)
	3 practical	b4:The student can estimate micro element cations	Determination of iron, zinc, manganese and copper in Plant using atomic absorber	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Practical short Quiz (3)
15	2 Theoretical	a2:The student gets to know the importance of boron molybdeum ,absorption transformation within the plant ,Symptoms of deficiency	Boron and molybdeum in Plant	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test Quiz (3)
	3 practical	b4:The student can estimate Boron and molybdeum	Determination of boron and molybdeum in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Homework

11. Course Evaluation

	Evaluation	Time of evalution	Degree	Relative weight
1	Report 1	Fourth week	2.5	2.5
2	Report 2	Fifth week	2.5	2.5
3	Quiz (1)	eighth week	2	2
4	Quiz (2)	Fourteenth week	2	2
5	Quiz (3)	Fifteenth week	1	1
6	Semester Exam (1)	Sixth week	7.5	7.5
7	Semester Exam (2)	eleventh week	7.5	7.5
8	Report3	seventh week	5	5
9	Report4	thirteenth week	2	2
10	Practical Quiz (1)	First week	1	1
11	Practical Quiz (2) Quiz	Fourth week	0.5	0.5
12	Practical Quiz (3) Quiz	Fourteenth week	1	1
13	Homework	weeks13:12:11:10:9:8:7:6:5:3:15	5.5	5.5
14	Final theoretical test	Final Semester Exams	40	40
15	Final Practical Test	Final Semester Exams	20	20
Sum	Total	100	100 %	%100

1. Learning and Teaching Resources	
The relationship of soil, water and plants - Dr. Saad Allah Al-Nuaimi	Required textbooks (methodology, if any)
Water in plant life - Dr. Riad Abdel Latif	Main references (sources)
The relationship of soil, water and plants - Dr. Qutaiba Muhammad Hassa Plant physiology. Dr.. Abdul Azim Kazem	Recommended books and references (scientific journals, reports...)
	Electronic References, Websites



Mr. Fatih Abid Hassan
Theoretical subject lecturer



Mrs. Alia Abdul Latif Jassim
Practical subject lecturer



Dr. Abdul Qader Abash Sabak
Chairman of the Scientific Committee




Dr. Khalid Anwar Khalid
Head of the Department of Soil Sciences:

Course Description Form

Course Name:					
Soil chemistry					
Course Code:					
SOCH350					
Semester / Year:					
First semester/Third stage/2025–2026					
Description Preparation Date:					
1/9/2025					
Available Attendance Forms:					
In-person + online					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical +3 practical /4 units					
Course administrator's name (mention all, if more than one name)					
Name: Assistant Prof.dr. Abdalkader Absh Sbak Email:dr.abdalkaderabshsbak@uomosul.edu.iq Name: Ahmed samer ghanim Email : ahmedaltaay1986@uomosul.edu.iq					
Course Objectives					
• The learner should be able to understand and comprehend what is related to the chemical properties of soil. • Choosing the extent of the suitability of the factors affecting the knowledge and study of the most important chemical reactions that occur in the soil solution. • Differentiating between the natural systems of reactions that occur between the different solid and liquid phases of soil. • Understanding the basics of detecting the type of minerals that control dissolution and precipitation. • Enabling the student to identify the most important laboratory methods for estimating chemical elements in the soil and its condition, materials and work methods for estimating each element and the devices used to estimate. • Familiarizing the student with the information he needs and what is available to him to master his work • The student's awareness of the factors affecting chemical reactions • Determining the appropriate type of methods suitable for chemical analysis and what must be taken into account when conducting it. • Enabling the student to measure chemical elements quantitatively and volumetrically upon reaching the end of the clear reaction point.					
Teaching and Learning Strategies					
Interactive lecture Brainstorming Dialogue and discussion Field Training Practical exercises Field project Self-education					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical	A1: The student learns about the types of elements involved in the composition of the Earth's crust B1: The student distinguishes between types of rocks (igneous, sedimentary, metamorphic)	About the chemical composition for the earth's crust	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3practical	C1: The student collects different soil samples C2: Grinds and sieves soil samples C3: Prepares soil samples for analysis	The student plans to collect a comprehensive sample of the entire field for the purpose of preparing it for chemical analyses	practical : Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
2	2Theoretical	A2: The student identifies the close relationship between the three soil phases A3: The student describes the volumetric relationship between soil components	The student understands the relationship of soil chemistry with other sciences	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	A1: Recognizes the basic units C4: Converting units to other units according to international and basic units A2: Demonstrates the conversion of old units to new units	Basic and universal units	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
3	2Theoretical	A4: The student differentiates between crystalline systems by the number of faces, axis length, and interfacial angles B2: The learner distinguishes between the cubic, hexagonal, triangular, monoclinic, and triangular systems.	Metal part chemistry	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C5: Measures soil pH C6: Measures total dissolved salts in the soil	Methods for estimating soil pH and total dissolved salts in the soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
4	2Theoretical	A5: The student learns about the most important sources of organic matter C1: The student discovers the general structure of organic matter B3: The student evaluates the stages of decomposition of organic matter	1- Sources of organic matter 2-The general composition of organic matter	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	B1: Cation exchange capacity is extracted by saturation with sodium acetate C6: Measures the cation exchange capacity with a flame photometer	Exchange capacity of cations	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
5	2Theoretical	A6: The student learns about the physical and chemical properties of humus through the color of the soil. B4: The student evaluates the nature of the relationship between humic compounds and their solubility in acidic and basic media	1- Physical and chemical properties of humus 2- Basic totals For humic compounds	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3practical	C6: Ammonium oxalate is used in the determination of active calcium carbonate C6: Analyze the remaining amount of oxalate by titration with potassium permanganate	Effective calcium carbonate	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
6	2Theoretical	A6: The student determines the nature of the chemical composition of the soil solution from ionic species C2: The student is familiar with the nature of the chemical equilibrium of the soil solution	1- Chemical composition of soil solution 2- The nature of the chemical equilibrium of the soil solution	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Determines gypsum in the soil using acetone C6: Draw the relationship between the electrical conductivity of the soil extract and the gypsum concentration	Gypsum in the soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
7	2Theoretical	C3: The student explains the process of gaining or losing a proton C4: The student explains the process of gaining or losing an electron	1- Neutralization reactions of acids and bases 2- Oxidation and reduction reactions	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Calculates the regulatory capacity in the soil through pH readings A3: Draw the relationship between the electrical conductivity of the soil extract and the gypsum concentration	Regulatory capacity in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
8	2Theoretical	A6: The student explains the phenomena that occur between the liquid and solid phases of soil B5: The student applies some equations to explain the reaction on clay surfaces	1- Double electrical layer 2- Equations that describe the electrical double layer	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Soil pH is calculated through pH readings A4: Draws the relationship between soil pH and the concentration of the added acid or base	Soil buffer	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
9	2Theoretical	A6: The student describes the ion exchange process using the law of mass action B6: The student evaluates the ion exchange process based on the type of charge and the size of the ion	1- Characteristics of ion exchange 2- Factors affecting ion exchange reactions	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: The student makes a soil extract C6: The student measures the dissolved sodium element in the extract using a flame photometer	Calculating exchanged ions in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical	Short practical test1

		A6: Draws the relationship between the reading obtained from the device and the element concentration from the standards of the standard solution.		exercises, and self-learning	
10	2Theoretical	B6: The student applies the Freundlich and Lankmeier equation to describe the process of adsorption and release B6: The student applies the equations (Kerr, Fanselow, and Capon) to describe the exchange processes between positive ions of similar and different valences.	1- Physicochemical equations (Freundlich, Langmuir) 2- Chemical equations (Kerr, Fanselow, Capon)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: The student makes a soil extract C6: The student measures the dissolved potassium element in the extract using a flame photometer A6: Draws the relationship between the reading obtained from the device and the element concentration from the standards of the standard solution.	Calculating exchanged ions in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
11	2Theoretical	A6: The student describes the process of dissolving CO ₂ gas in water B6: The student evaluates the role of carbonic acid in the solubility of metals	1- CO ₂ -H ₂ O system 2- CaCO ₃ -CO ₂ -H ₂ O system	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Measures calcium in soil extract by titration with EDTA C6: Measure calcium and magnesium in soil extract by titration with EDTA using the EBT index.	calculating exchanged ions in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
12	2Theoretical	C5: The student explains the nature of ionization of phosphoric acid A6: The student uses chemical equations to describe the reactions of phosphorus in soil	1- The nature of ionization of phosphoric acid 2- Phosphorus reactions in the soil	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Measures dissolved chloride in soil extract by titration with silver nitrate	Calculating exchanged ions in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
13	2Theoretical	A6: The student draws dissolution diagrams to determine the metal controlling the dissolution C6: The student draws dissolution diagrams to determine the metal controlling the dissolution	1- Melting schemes for carbonate minerals 2- Melting schemes for phosphorus minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3practical	C6: Extracts humic compounds in the soil by neutralizing them with sodium bicarbonate solution C6: Extracts humic compounds in the soil by neutralizing them with sodium hydroxide solution C6: The percentage of organic carbon in it is calculated using wet oxidation	Humic compounds in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
14	2Theoretical	C6: The student explains the importance of soil pH A6: The student learns about the most important sources of acidity in the soil	1- The importance of studying soil pH 2- Sources of acidity in the soil	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Calculates the ionic strength of single-charged compounds C6: Calculates the ionic strength of double-charged compounds C6: Calculates the ionic strength of triple-charged compounds	Ionic strength in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
15	2Theoretical	C6: The student identifies the type of salinity and its sources B6: The student evaluates the salt composition of the soil based on knowledge of the dominant ions	1- Sources of salinity in the soil 2- The salt composition of saline soils	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: Calculates the effectiveness factor for single-charge compounds C6: Calculates the reactivity coefficient for double-charged compounds C6: Calculates the reactivity coefficient for triple-charged compounds	Coefficient of effectiveness and effectiveness in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1

Course Evaluation

	Calendar methods	Calendar date (week)	degree	Relative weight %
1	Report 1	fourth week	brother	2.5
2	Report 2	The fifth week	brother	2.5
3	Short test (1) Quiz	the sixth week	a	2
4	Short test (2) Quiz	The fourteenth week	a	2
5	Short test (3) Quiz	The fifteenth week	1	1
6	Semester test (1)	the sixth week	H.K	7.5
7	Semester test (2)	The eleventh week is difficult	H.K	7.5
8	Final theoretical test	Final semester exams	40	40
9	Practical field project	The fifteenth week	Kh	5
10	Field evaluation	The third and fifth week	a	2
11	Practical short test (1) Quiz	The first week	1	1
12	Short practical test (2) Quiz	fourth week	0.kh	0.5
13	Short practical test (3) Quiz	The fourteenth week	1	1
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12 and 13	Kh.kh	5.5
15	Final practical test	Final semester exams	20	20
	total	100	100%	%100

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil Chemistry book, written by Dr. Kazem Mashhout 1986
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Main references (sources)	
Recommended books and references (scientific journals, reports...)	The book (Soil Minerals) written by Prof. Dr. Salman Khalaf Issa
Electronic References, Websites	



dr.Abd Alkader Absh Sbak

Theoretical subject teacher



Ahmed Samir Ghanem

Practical subject teacher



dr.Abd Alkader Absh Sbak

Chairman of Scientific Committee




dr. Khaled Anwer Khaled

Head of the Department

Course Description Form

Course Name:					
Soil Pollution and Water					
Course Code:					
SOPW351					
Semester / Year:					
First Semester / 2025-2026					
Description Preparation Date:					
1 / 9 / 2025					
Available Attendance Forms:					
Presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 Theory + 3 Practical / 3 units					
Course administrator's name (mention all, if more than one name)					
Name: Dr. Qahtan Darwish Essa					
Email: qahtan_darwish@uomosul.edu.iq					
Course Objectives					
Theory: -Enabling the student to understand the concepts of soil and water pollution -Enabling the student to understand the resources of soil and water pollution - Introducing the student to methods for treating contaminated soil -Enable the student to calculate the level and degree of soil and water pollution			Practical : - Enabling the student to recognize the most important methods for calculating the degree of pollution, assessing the level of pollution, and measuring some characteristics that are considered standards for soil and water quality		
Teaching and Learning Strategies					
Strategy		- Interactive lecture, Brainstorming, - Dialogue and discussion, - Assigning tasks and reporting - Assigning group work to reveal leadership skills			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theory	Theory: a1: The student identifies pollution to the ecosystem And pollutants	Theory Entrance to pollution For the ecosystem	Theory : -Auditory methods,	Exams, Homework, Reports.
	3 Pract.	b2: The student Learns about pollution And pollutants	Definition of pollution and pollutants	Assigning tasks and reports	Exams, Homework, Reports.
2	2Theory	a2: Entrance to pollution For the ecosystem	The concept of pollution and its sources Its types and negative effects	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3 Pract.	a13:Definition of pollution and pollutants	The effect of pollution on Human, animal,	Assigning tasks and reports	Exams, Homework, Reports

			Plant,		
3	2theory	Theory: c1: The student learns about the types Soil contamination	Theory: Types of soil pollution	- Style of writing on the blackboard. - Direct dialogue	Exams, Homework, Reports
	3 pract.	b3: The student is familiar with toxic gases	dust, toxic gases, Oxides Sulfur oxides Nitrogen, sulfide Hydrogen	Assigning tasks and reports	Exams, Homework, Reports
4	2theory	a3: The student recognizes a gas Nitrogen and its degradation in the environment	Nitrogen gas and its cycle In the environment	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	b4: The student is familiar with air pollution	Air pollution, its sources, Hydrocarbons	Assigning tasks and reports	Exams, Homework, Reports
5	2theory	a4: The student learns about each cycle of oxygen and carbon and sulfur in nature	Oxygen and carbon cycle and sulfur in nature	- Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3 pract.	b5:The student gets to know Water filtration project	Visit a water filtration project in Al-Rashedia	Assigning tasks and reports	Exams, Homework, Reports
6	2theory	a5: The student gets to know Chemical contamination of soil agricultural samples	Chemical contamination of soil agricultural	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	b6:The student examines water samples	Measurement of temporary hardship and permanent	Assigning tasks and reports	Exams, Homework, Reports
7	2theory	b1: The student identifies the risks of pollution on plant growth and human health	Chemical pollution and its impact on plant growth and human health	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	b7: The student measures salinity Soil acidity	Calculate the salinity of water and acidity calculation and basal	Assigning tasks and reports	Exams, Homework, Reports
8	2theory	a6:The student masters processing Chemical pollution	Treating Chemical pollution	- Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	b8:The student measures calcium and magnesium	Measure calcium and magnesium with water	Assigning tasks and reports	Exams, Homework, Reports

9	2theory	a7: The student learns about pathogenic microbes in the soil	Pathogenic microbes For humans and animals in the soil	-Auditory methods,	Exams, Homework, Reports
	3pract.	b9:The student Identifies methods of measuring pollution	Methods of Measuring pollution of water and soil	Assigning tasks and reports	Exams, Homework, Reports
10	2theory	a8: The student is familiar with soil pollution with heavy metals	Soil contamination with heavy metals	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	c3:The student learns about pollution With powders, fertilizers and waste	Pollution with washing powders, fertilizers animal wastes	Assigning tasks and reports	Exams, Homework, Reports
11	2theory	a9:The student masters processing Contaminated lands	Treatment of contaminated lands	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	a14:The student gets to know Spectrometer	Visible light Spectrometer and the elements it measures	Assigning tasks and reports	Exams, Homework, Reports
12	2theory	a10: The student learns about pollution Water	Water Pollution	-Auditory methods,	Exams, Homework, Reports
	3pract.	b10:The student measures the vital requirement and The chemistry in water	Measurement of COD and BOD	Assigning tasks and reports	Exams, Homework, Reports
13	2theory	a11: The student judges soil pollution	Modern standards for evaluation Soil pollution level	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	c4:The student gets to know Atomic Absorption device	Absorption device Atomic matter and its components	Assigning tasks and reports	Exams, Homework, Reports
14	2theory	a12: The student learns methods Pesticide transmission	Methods of transmission of pesticides In the soil	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports

	3pract.	b11:The student learns about pollution With pesticides	Pesticide contamination	Assigning tasks and reports	Exams, Homework, Reports
15	2theory	c2: The student is familiar with the effect of pesticides on organisms	The effect of pesticides on Activity of microorganisms in soil	-Auditory methods, - Style of writing on the blackboard. - Direct dialogue style	Exams, Homework, Reports
	3pract.	b12:The student explains the risks Radioactive isotope contamination	Risks of isotope contamination Radioactive	Assigning tasks and reports	Exams, Homework, Reports
Course Evaluation					
1	Evaluation Methods		Evaluation Date	Degree	Relative weight %
	Final report theory + pract. Report		Theory 15 weeks Pract. 1-15 week	7 Theory + 6 pract.	% 13
	Short exam (1)		Week (3)	4 Theory + 2 pract.	% 6
	Half exam (theory + pract.)		Week (9)	10 Theory + 5 pract.	% 15
	Short exam (2)		Week (12)	4 Theory + 2 pract.	% 6
	Final exam (practical)		Exam pract.	20	% 20
	Final exam (theory)		Exam theory	40	% 40
				100	% 100
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Book (Soil pollution and water) Dr. Mahmood Al-Jumaili and Salwa Hadi (2018)		
Main references (sources)			Book (Soil pollution and water) Dr. Shikhani, Dr. Mohammad Samer, Dr Aiad Foad (2015)		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Teacher of Theory : Dr. Qahtan Darwish Essa

Teacher of Practical : Mr. Ahmed Sameer Ghanim

Chairman of the Scientific Committee :
Dr. Abd Al-Qader Abash Sbak

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



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Course Description Form – Design and Analysis of Agricultural Experiments

1. Course Name:
Design and Analysis of Agricultural Experiments
2. Course Code:
DAAE302
3. Semester / Year:
Annual – First (Fall) Semester 2025–2026
4. Date of Preparation of this Description:
1/9/2025
5. Available Attendance Forms:
In-person (on-campus)
6. Number of Credit Hours (Total) / Number of Units (Total):
2 theoretical + 3 practical / 3 units
7. Name of Course Administrator (if more than one name is mentioned):
Name: Assist. Lect. Ruaa Raad Ghanem

8. Course Objectives
Theoretical: - Enabling the student to learn how to design experiments in the agricultural field in general, and in animal production in particular. - Enabling the student to understand and apply all the formulas related to analysis procedures and testing of results. - Enabling the student to select the appropriate design for the experiment, distribute treatments over the experimental units, and record observations. - Enabling the student to collect, tabulate, and analyze data, perform significance testing, discuss and interpret the results, and determine the best experimental treatments. - The student will be able to analyze a study of several factors through a factorial experiment in an appropriate design, by studying the levels of several factors in factorial treatments to determine the best of them. Practical: - Enabling the student to learn how to read and analyze practical research data properly, and to understand how electronic statistical analysis software such as SAS and SPSS works.

9. Teaching and Learning Strategies	
Theoretical: - Interactive lecture - Brainstorming - Dialogue and discussion - Assignments and reports - Observing the direct implementation of applied field experiments	Practical: - Group work assignments - Assignments and reports for each problem

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Topic Name	Learning Method	Evaluation Method
1	2 theoretical 3 practical	Theoretical – A1: Recalls measures of central tendency and the components of the analysis of variance (ANOVA) table. Practical – A11: The student solves some examples on measures of central tendency and dispersion.	Theoretical: Some statistical measures – examples and homework. Practical: Measures of central tendency (mean, median, mode) and measures of dispersion (mean deviation, variance, coefficient of variation).	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
2	2 theoretical 3 practical	Theoretical – A2: Identifies the basic concepts and fundamental rules of design, the requirements of a good experiment, and the steps followed in scientific experiments. Practical – A12: The student learns how to solve direct questions in the Completely Randomized Design.	Theoretical: Chapter One (Introduction). Practical: The Completely Randomized Design (C.R.D.) and the method of solving direct questions.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
3	2 theoretical 3 practical	Theoretical – A3: States the definition, advantages, and disadvantages of the design and the ANOVA table for the Completely Randomized Design. Practical – A13: The student understands how to solve indirect questions in the Completely Randomized Design.	Theoretical: The Completely Randomized Design – examples and homework. Practical: Some important formulas in the Completely Randomized Design for solving indirect questions; solving some indirect questions and assigning homework.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
4	2 theoretical 3 practical	Theoretical – A4: Knows how to use the appropriate test for comparing means. Practical – A14: The student learns how to use and solve exercises related to mean comparison tests.	Theoretical: Comparison between means – examples and homework. Practical: Dunnett's test and the Least Significant Difference (LSD) test.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
5	2 theoretical 3 practical	Theoretical – A5: Uses Duncan's test to compare treatment means. Practical – A15: The student learns the method of solving Duncan's test questions for comparing means.	Theoretical: Comparison between means – examples and homework. Practical: Duncan's test.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions

Week	Hours	Required Learning Outcomes	Unit or Topic Name	Learning Method	Evaluation Method
6	2 theoretical 3 practical	Theoretical – C1: Explains how to construct the ANOVA table in the case of unequal numbers of replications. Practical – A16: The student benefits from solving exercises on the Completely Randomized Design with unequal replications.	Theoretical: The Completely Randomized Design (with unequal numbers of replications) – examples and homework. Practical: The method of solving direct questions in the Completely Randomized Design with unequal replications.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
7	2 theoretical 3 practical	Theoretical – A6: States the definition, advantages, and disadvantages of the design and the ANOVA table for the Randomized Complete Block Design. Practical – A17: The student understands how to solve direct exercises in the Randomized Complete Block Design.	Theoretical: The Randomized Complete Block Design – examples and homework. Practical: The method of solving direct questions in the Randomized Complete Block Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
8	2 theoretical 3 practical	Theoretical – A7: States the relative efficiency formula for the Randomized Complete Block Design compared with the Completely Randomized Design. Practical – A18: The student learns about indirect questions in the Randomized Complete Block Design and how to solve them.	Theoretical: The Randomized Complete Block Design (relative efficiency) – examples and homework. Practical: Some important formulas for solving indirect questions; indirect questions in the Randomized Complete Block Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
9	2 theoretical 3 practical	Theoretical – A8: States the definition, advantages, and disadvantages of the design and the ANOVA table for the Latin Square Design. Practical – A19: The student compares the Completely Randomized Design with the Randomized Complete Block Design using the relative efficiency formula.	Theoretical: The Latin Square Design – examples and homework. Practical: Relative efficiency and the missing observation in the Randomized Complete Block Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
10	2 theoretical 3 practical	Theoretical – A9: States the relative efficiency formula for the Latin Square Design compared with the Completely Randomized Design and the Randomized Complete Block Design.	Theoretical: The Latin Square Design (relative efficiency) – examples and homework. Practical: Direct questions in the Latin Square Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue.	Quizzes, homework assignments, discussions

Week	Hours	Required Learning Outcomes	Unit or Topic Name	Learning Method	Evaluation Method
		Practical – A20: The student learns about the Latin Square Design and the method of solving direct questions.		Practical: assignments and a report.	
11	2 theoretical 3 practical	Theoretical – C2: Explains the formula for estimating the missing observation in the Latin Square Design. Practical – A21: The student finds the key to the solution in the indirect question for the Latin Square Design.	Theoretical: The Latin Square Design – examples and homework. Practical: Some important formulas for solving direct questions; indirect questions in the Latin Square Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
12	2 theoretical 3 practical	Theoretical – A10: States the definition, advantages, and disadvantages of factorial experiments and the ANOVA table for factorial experiments. Practical – A22: The student compares the Randomized Complete Block Design with the Latin Square Design using the relative efficiency formula.	Theoretical: Factorial experiments – examples and homework. Practical: Relative efficiency of the Latin Square Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
13	2 theoretical 3 practical	Theoretical – C3: Explains how to construct the ANOVA table and the interaction curve for a factorial experiment using the Completely Randomized Design. Practical – A23: The student benefits from using the formula for estimating the missing observation in the Latin Square Design.	Theoretical: Factorial experiments – examples and homework. Practical: Relative efficiency and the missing observation in the Latin Square Design.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions
14	2 theoretical 3 practical	Theoretical – C4: Explains how to find the number of factorial treatments, the mathematical model equation, and the interaction curve for a three-factor factorial experiment. Practical – A24: The student learns about factorial experiments in the Completely Randomized Design and how to solve exercises for a two-factor experiment.	Theoretical: Factorial experiments – examples and homework. Practical: Factorial experiments in the Completely Randomized Design – a two-factor experiment.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions

Week	Hours	Required Learning Outcomes	Unit or Topic Name	Learning Method	Evaluation Method
15	2 theoretical 3 practical	Theoretical – C5: Explains how to construct the ANOVA table and the interaction curve for a factorial experiment using the Randomized Complete Block Design. Practical – A25: The student learns about factorial experiments in the Completely Randomized Design and how to solve exercises for a three-factor experiment.	Theoretical: Factorial experiments – examples and homework. Practical: Factorial experiments in the Completely Randomized Design – a three-factor experiment.	Theoretical: audio-visual methods, writing on the board, and direct dialogue. Practical: assignments and a report.	Quizzes, homework assignments, discussions

11. Course Assessment

No.	Assessment Methods	Assessment Time (Week)	Marks	Relative Weight %
1	Final theoretical report + practical experiment reports	Theoretical: Week 15 Practical: Weeks 1–15	7 theoretical + 6 practical	13%
2	Quiz (1)	Week (3)	4 theoretical + 2 practical	6%
3	Midterm Exam (theoretical and practical)	Week (10)	10 theoretical + 5 practical	15%
4	Quiz (2)	Week (12)	4 theoretical + 2 practical	6%
5	Final practical examination	Practical examinations week	20	20%
6	Final theoretical examination	Theoretical examinations week	40	40%
Total			100	100%

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	Design and Analysis of Agricultural Experiments textbook
Main references (sources)	The official textbook approved by the Ministry
Recommended supporting books and references (scientific journals, reports, ...)	Lectures published by Iraqi universities
Electronic references, websites	

Theoretical Course Instructor:
Dr. Muthanna Fathi Abdullah



Assist. Prof. Dr. Abdulqadir Abash Sabak
Head of the Scientific Committee

Practical Course Instructor:
Assist. Lect. Ruaa Raad Ghanem



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

Remote Sensing Course Description

1. : Course name					
remote sensing					
2. : Course code					
RESE352					
3. : Chapter / Year					
the chapter 2025 - 2026 / Third phase / Second spring					
4. : Date this description was prepared					
2026/2/1					
5. Available attendance forms:					
In-person/online					
6. :Number of study hours (total) / Number of units (total)					
2theoretical + 3 practical / 3 units					
7. : Name of the course administrator (if more than one name is mentioned)					
Aman Adel Mouloud aman_adel@uomosul.edu.iq Shaymiaa Ghanem Dawod Shaymiaa.Al-taie1983@uomosul.edu.iq					
8. Course objectives					
- Empowerment The student from to understand And comprehension what Related By remote sensing And its relationship Soil and Water Resources Sciences -Empowerment The student from knowledge Most important features remote sensing -Empowerment The student from Familiarity Most important Applications of remote sensing in other sciences - Empowerment The student With ability Detection on Space data -can The student that Interprets, processes, and outputs .remote sensing maps - Empowerment - The student from Recognition on Most important Roads Laboratory - in Monitoring changes in vegetation cover and detection on Reflectivity of every phenomenon on the Earth's surface					
9. Teaching and learning strategies					
- Interactive lecture - brainstorming - Dialogue and discussion - Field training - Practical exercises - Field project - Self- learning					
10. Course structure					
week	watch es	Required learning outcomes	Name of unit or topic	Learning method	Evaluatio n method

1	2 theoretical	The student should be able to demonstrate :A1 sound knowledge and understanding of remote .sensing He has the practical and mental knowledge and :B1 . concepts that help him in remote sensing	Introduction to Remote Sensing	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 1 Final Exam
	3 practical	The student should be able to demonstrate :A1 sound knowledge and understanding of remote .sensing Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty	Concepts and foundations of remote sensing	,Interactive lecture brainstorming, dialogue and discussion, field training, self- learning	Short practical test 1
2	2 theoretical	The most important The student Explains :A2 remote sensing operations He has the practical and mental knowledge and :B1 concepts that help him in the stages of remote . sensing	Stages and processes of remote sensing	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 1 Final Exam
	3 practical	Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory instruments within the .specialty	Aerial survey sources and information	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	a report
3	2 theoretical	The most important The student Explains :A2 remote sensing operations	Properties of electromagnetic radiation	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 1 Final Exam
	3 practical	Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty The student should be able to suggest methods :B5 for analyzing aerial photographs and data and .interpreting agricultural phenomena	Types of aerial photographs and the difference between them	,Interactive lecture brainstorming, dialogue and discussion, field training, self- learning	Field evaluation
4	2 theoretical	The most important The student Explains :A2 remote sensing operations Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty The student will use computer programs to :D1 analyze and display data and information in the field . of remote sensing	Remote sensing and electromagnetic spectrum applications	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 1 Final Exam Report ,
	3 practical	Any means of The student Discover :C6 distinguishing between remote sensing items and C9 able to use laboratory instruments within the The student should be able to conduct :specialty applied research and use statistical programs in .experimental design and data analysis	Coordinate system on aerial photographs and distance between points	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Short Practical Test 2
5	2 theoretical	Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty The student will use computer programs to :D1 analyze and display data and information in the field . of remote sensing	Characteristics of aerial photographs	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 1 Final Exam Report ,
	3 practical	Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty	Finding ground coordinates	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Field evaluation

		A special equation any The student Depends :D4 for reflectivity, uses information technology to . obtain data and information easily and conveniently			
6	2 theoretical	The most important The student Explains :A2 remote sensing operations Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty The student will use computer programs to :D1 analyze and display data and information in the field . of remote sensing	Spectral reflectance ,properties of soil plants, and water	,Interactive lecture brainstorming, dialogue and discussion, self-learning	,short test final test
	3 practical	The student should be able to analyze data :C2 .related to satellites and use calculators and programs A special equation any The student Depends :D6 for reflectivity, uses information technology to . obtain data and information easily and conveniently	Spectral bands and their ranges in satellites and reflectivity reading	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Live drawing and homework
7	2 theoretical	The student should be able to demonstrate :A1 sound knowledge and understanding of remote . sensing The student should be able to analyze data :C3 .related to satellites and use calculators and programs	Study of space visuals	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 2 Final Exam
	3 practical	The student should be able to analyze data :C5 .related to satellites and use calculators and programs The student will use computer programs to :D1 analyze and display data and information in the field . of remote sensing The student will work efficiently and :E3 effectively in the field of work and practice the .characteristics and features of satellites	Black and white film and color film	,Interactive lecture brainstorming, dialogue and discussion, field training, practical ,exercises, field project self-learning	Field project
8	2 theoretical	Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty The student should be able to analyze data :C4 .related to satellites and use calculators and programs	Spectral, radiometric and temporal resolution	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 2 Final Exam
	3 practical	The student should be able to analyze data and :B6 information in the land, water and environment .sector to find the most appropriate solutions Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty	Engineering analysis of systems	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	, drawing homework
9	2 theoretical	The student should be able to demonstrate :A1 sound knowledge and understanding of remote . sensing The student should be able to analyze data :C6 .related to satellites and use calculators and programs	Elements of aerial photo interpretation	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Midterm ,Exam 2 Final Exam
	3 practical	The student should be able to analyze data and :B4 information in the land, water and environment . sector to find the most appropriate solutions A special equation any The student Depends :D6 for reflectivity, uses information technology to . obtain data and information easily and conveniently	Thermal aerial photography	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Live drawing and homework

10	2 theoretical	The most important The student Explains :A2 remote sensing operations The student should be able to analyze data :C3 .related to satellites and use calculators and programs	Interpretation of phenomena in images and visuals	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Term 2 Exam
	3 practical	Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty A special equation any The student Depends :D3 for reflectivity, uses information technology to . obtain data and information easily and conveniently	Thermal energy detectors in observing the Earth's surface features	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Live drawing and homework
11	2 theoretical	The most important The student Explains :A2 remote sensing operations Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty	Spectral and temporal resolution of satellites	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Final exam
	3 practical	The student should be able to analyze data and :B5 information in the land, water and environment . sector to find the most appropriate solutions The student should be able to analyze data :C2 .related to satellites and use calculators and programs The student should be proficient in using :C4 , modern technologies, managing machines .equipment , and geographic information systems	Study of the objective, enhanced and processed mapper for satellites	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Live drawing and homework
12	2 theoretical	The most important The student Explains :A2 remote sensing operations The student should be able to analyze the :B2 factors that have a mutual influence between water .scarcity, desertification, and climate change Any means of The student Discover :C6 distinguishing between remote sensing items and able to use laboratory tools within the specialty	Definition of spatial resolution of satellite imagery and the capabilities of . different sensors	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Final exam
	3 practical	The student should be able to analyze data and :B1 information in the land, water and environment . sector to find the most appropriate solutions The student should be able to identify and :B4 .measure land areas and conduct spatial analysis The student should be able to analyze data :C5 .related to satellites and use calculators and programs	Multispectral combining	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Live drawing and homework
13	2 theoretical	The most important The student Explains :A2 remote sensing operations The student should be able to analyze data :C3 .related to satellites and use calculators and programs	Types of satellite images according to spatial resolution and their classification according to the .most accurate	,Interactive lecture brainstorming, dialogue and discussion, self-learning	Final exam
	3 practical	The student should be able to analyze the :B20 factors that have a mutual influence between water .scarcity, desertification, and climate change The student should be able to identify and :B48 .measure land areas and conduct spatial analysis The student should be able to analyze data :C9 .related to satellites and use calculators and programs	Use of calculator to differentiate and interpret spatial .data	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Live drawing and homework
14	2 theoretical	Any means of The student Discover :C6 distinguishing between remote sensing vocabulary and able to use laboratory tools within the specialty	Radiation accuracy of sensors and their .factors	,Interactive lecture brainstorming, dialogue	,short test final test

		The student should be able to analyze data :C3 .related to satellites and use computers and programs		and discussion, self-learning	
	3 practical	The student should be able to analyze data :C5 .related to satellites and use calculators and programs The student should monitor changes in natural :C3 ,phenomena such as soil degradation, desertification and water pollution, which lead to the death of .beneficial organisms A special equation any The student Depends :D1 for reflectivity, uses information technology to . obtain data and information easily and conveniently	remote sensing software in the .study of space data	,Interactive lecture brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Short practical test 3
15	2 theoretical	Any means of The student Discover :C6 distinguishing between remote sensing vocabulary and able to use laboratory tools within the specialty The student should be able to analyze data :C2 .related to satellites and use computers and programs The student will work efficiently and :E3 effectively in the field of work and practice the .characteristics and features of satellites	Elements of aerial photographs and comparison between .images	,Interactive lecture brainstorming, dialogue and discussion, self-learning	,short test final test
	3 practical	The student should be able to analyze data :C1 .related to satellites and use calculators and programs The student should monitor changes in natural :C3 ,phenomena such as soil degradation, desertification and water pollution, which lead to the death of .beneficial organisms The student will use computer programs to :D1 analyze and display data and information in the field . of remote sensing	ERDAS Using and software ArcMap	,Interactive lecture brainstorming, dialogue and discussion, field training, practical ,exercises, field project self-learning	Field project

11. Course Evaluation

T	Evaluation methods	Calendar appointment (week)	degree	Relative % weight
1	Report 1	Fourth week	2.5	2.5
2	Report 2	Fifth week	2.5	2.5
3	Short Test (1)Quiz	Week 6	2	2
4	Short Test (2)Quiz	Fourteenth week	2	2
5	Short Test (3)Quiz	The fifteenth week	1	1
6	Midterm Exam (1)	Week 6	7.5	7.5
7	Midterm Exam (2)	The eleventh week	7.5	7.5
8	Final theoretical exam	Final semester exams	40	40
9	Practical field project	The fifteenth week	5	5
10	Field evaluation	The third and fifth week	2	2
11	Practical Short Test (1)Quiz	First week	1	1
12	Practical Short Test (2)Quiz	Fourth week	0.5	0.5
13	Practical Short Test (3)Quiz	Fourteenth week	1	1
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12, and 13	5.5	5.5
15	Final practical exam	Final semester exams	20	20
	the total	100	%100	%100

12. Learning and teaching resources

Required textbooks (methodology if any)	Dagestani, Hikmat
Introduction to Remote Sensing	

Main references (sources) Remote sensing	Lilisand
Recommended supporting books and ,references (scientific journals (...reports	Internet
Electronic references, websites	nothing



Theoretical subject teacher
Aman Adel Mawloud



Practical subject teacher
Shaymiaa Ghanem Dawod



Dr. Abdul Qader Abash
Chair of the Scientific Committee



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



Course Description Form

1. Course Name:					
Soil salinity					
2. Course Code:					
SSAL353					
3. Semester / Year: spring					
Spring second semester 2025–2026					
4. Description Preparation Date:					
19 /1/ 2026					
5. Available Attendance Forms: Mandatory attendance					
Cuonpuncry + Onlin					
6. Number of Credit Hours (Total) / Number of Units (Total) :					
2 theoretical + 3 practical 4 units					
7. Course administrator's name (mention all, if more than one name)					
Qahtan Darwish Essa Roaa Raad Ghanim					
8. Course Objectives					
theoretical 1- Study the chemical properties of saline soil. 2- Chemical reactions in saline soil solution. 3- Mechanism of salt movement and transport in saline soils. 4- The effect of soil salinity on plant growth.			practical : Enabling the student to recognize the most important ways to study and learn about The most important methods of analysis and diagnosis and the most important diagnosis of saline soils.		
Teaching and Learning Strategies					
My theory: 1- Knowledge and understanding. 2- Identifying the problem of salinity, the nature of its treatment, and methods of living with it. 3- Identify the ionic structure of salts. 4- Identifying the salt phases of soils affected by salinity. 5- The possibility of preparing a salt map for areas affected by salinity in order to develop scientific programs for their reclamation. Study.			practical: - Adapting to teamwork to reveal skills. - Assignment of tasks and reports for each committee.		
9. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2 Theoretical	A2: Explains to the student what it is Saline soils	Soil salinity	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	B1: Shows the student nature Saline soils.	Soils are saline in nature	Assigning tasks And report.	assignments, discussions
2	2 Theoretical	C1: Shows the student how the appearance of Wasel saline soils	The origin of the appearance of salts	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	B6 : Shows the student how Get a solution Saline soils	Soil solution	Assigning tasks And report.	assignmets, discussios
3	2 Theoretical	A3: Explains to dogs what factors are responsible About soil formation Saltiness	Factors responsible for formation Salts	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	C6: Explain to the student what it is Cations in solution the soil	Cations in soil solution	Assigning tasks And report.	assignments, discussions
4	2 Theoretical	A4: Explains to the student what are the characteristics of soil Saltiness	Chemical properties And the physics of salts	The salib audio style Write on Chalkboard style Direct dialogue	Short exams, assignmets, discussions
	3 practical	C1: Shows the student the anions Responsible for Formation of saline soils	Anions in soil solution.	Assigning tasks And report.	

5	2 Theoretical	A4: Explains to the student the types of saline soils.	Types of soil salts	My theory: The salib audio style Write on Chalkboard style Direct dialogue	Short exams, assignments, discussions
	3 practical	B3: Shows the student methods of assessment Salinity in the field And laboratory	Salinity estimation methods and expression about her	Assigning tasks And report.	
6	2 Theoretical	A4: Explains the characteristics to the student soil chemicals salinity.	Chemistry of soils affected by salinity	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	C6: Shows the student how to collect Soil samples Salt from the field	Collecting soil samples	Assigning tasks And report.	assignments, discussions
7			First semester exam		
8	2 Theoretical	A3: Explain to the student what it is The relationship between salinity Soil and alkalinity	The relationship between salinity and alkalinity	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	B3:Explains to the student the estimation of sodium and potassium In saline soil converter	Determination of sodium potassium In soil transformer	Assigning tasks And report.	assignments, discussions
9	2 Theoretical	C3: Shows to the student Classification and naming of soils Saline and its diagnosis.	Classification and naming of saline soils	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,

	3 practical	A2: Explains to the student how Determination of calcium and magnesium In saline soil solution in the laboratory	Determination of calcium and magnesium In the soil solution	Assigning tasks And report.	assignments, discussions
10	2 Theoretical	A6: Explains to the student the effect of soil salinity on plant growth	The effect of salinity on plants	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	B1: Explains to the student how Determination of chlorides in solution Saline soil in the laboratory	Determination of chlorides in solution the soil	Assigning tasks And report.	assignments, discussions
11	2 Theoretical	A2: Explain to the student what it is Indicators used in Determine crop tolerance For salts	Indicators used in Determine crop tolerance For salts.	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	C1: Explains to the student how Carbonate estimation And bicarbonate in solution Saline soil in the laboratory	Determination of carbonates and bicarbonates In the soil solution	Assigning tasks And report.	assignments , discussions
12	2 Theoretical 3 practical	B1: Shows the student how evaluation of irrigation water quality C1: Explains to the student how Sulfate determination In solution	Irrigation water quality practical : Determination of sulfate in solution the soil	The salib audio style Write on Chalkboard style Direct dialogue practical : Assigning tasks	Short exams, assignments, discussions

		Saline soil		And report.	
13	2 Theoretical	A3: Explain to the student what it is Irrigation water classification systems.	Irrigation water classification systems	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	B1: Explains to the student how Determination of gypsum in solution Saline soil in the laboratory	Determination of gypsum in soil	Assigning tasks And report.	assignments, discussions
14	2 Theoretical	A5: Explain to the student what it is Methods of controlling salinity	Methods of controlling salinity practical : Determination of lime in soil	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	B5: Explains to the student how Determination of lime in solution Saline soil in the laboratory		Assigning tasks And report.	assignments, discussions
15			Second semester exam		

10. Course Evaluation

	Evaluation methods	Evaluation date	Grade Relative	weight %
1	Theoretical final report + practical experience reports	Theoretical week 15, practical week 15	7 theoretical + 6 practical	13%
2	Short test (1) Quiz	week (3)	4 theoretical + 2 practical	6%
3	Exam Midterm (theoretical + practical)	week (9)	10 theoretical + 5 practical	15%

4	Short test (2) Quiz	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	A week of practical exams	20	20%
6	Final theoretical test	The week of theoretical exams	40	100%
	the total		100	100%

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil salinity book / Dr. Ahmed Haider A Zubaidi 1989
Main references (sources)	Land environmental chemistry book.
Recommended books and references (scientific journals, reports...)	Al-Rafidain Agriculture Journal, S Science Journal
Electronic References, Websites	



Dr. Qahtan Darwish Essa

Theoretical subject lecturer



Mr. Roaa Raad Ghanim

Practical subject lecturer



Dr. Abdul Qader Abash Sabak
Chairman of the Scientific Committee




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

Course Description Form

1. Course Name:					
Soil morphology					
2. Course Code:					
SMOR354					
3. Semester / Year:					
Spring second semester/ 2025-2026					
4. Description Preparation Date:					
1/2/2026					
5. Available Attendance Forms:					
Compulsory, Virtual					
6. Number of Credit Hours (Total) / Number of Units (Total)					
Theory 2 – practical 3 /3 units					
7. Course administrator's name (mention all, if more than one name)					
Dr. khaled Anwer Khaled Email: khalid.newar31@uomosul.edu.iq Ms. Reem Waleed Abduljabar					
8. Course Objectives					
Enable the student to understand and comprehend what is related to soil morphology and its relationship to soil science and water resources - Enable the student to know the most important features of the soil profile - Enable the student to become familiar with the most important factors affecting the development of horizons - Empowering the student with the ability to detect diagnostic horizons - The student can explain the development of horizons and address the differences in results for the future over time practical: - Enabling the student to become familiar with the most important laboratory methods in studying macro- and micro-morphological characteristics and the important chemical and physical analyzes in distinguishing and studying soil horizons.					
9. Teaching and Learning Strategies					
Strategy reactive lectures critical thinking discussion Require to do several homework's and Write scientific report for different task during the semester		Practical: group work and cooperation among students. -learn various academic skills. -Do Homework, discussion in the lab and exercise related to hydrology and water resources			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theory	A1: The student explains the	The concept of soil morphology and its	Listening, Data show Using white board for	Quiz Participation during lecture

		concept of soil morphology	relationship to other sciences	Writing and drawing, discussion with students	and Monthly exams
	3 practical	B1: Practical and mental knowledge and To help student's in Soil morphology	Definition of morphology, its types, and methods for studying the pedon	Describe Different Samples, Doing various Lab works exercises	
2	2 theory	A1: The student explains the most important soil formation B1: Practical and mental knowledge and To help student's in Soil morphology	Terminology used in soil morphology	Listening, Data show Using white board for Writing and drawing, discussion with students	
	3 practical	C6: The student discovers any means of distinguishing horizons	distinguishing between soil pedon, soil profile, soil, and soil pedon	Describe Different Samples, Doing various Lab works exercises	
3	2 theory	A2: The student becomes familiar with the most important factors affecting the formation and development of the pedon	The main horizons in soil pedon	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz, Participation during lecture and Monthly exams
	3 practical	D3: The student discovers the difference in horizons within one pedon	Physiography of the region and pedons	Describe Different Samples, Doing various Lab works exercises	
4	2theory	A2: The student becomes familiar with the most important factors affecting the formation and development of the pedon E3: student should be able to deal efficiently in the field of work to transfer knowledge and skill to farmers .	Secondary horizons and their diagnosis	Listening, Data show Using white board for Writing and drawing, discussion with students	

	3 practical	C6: The student discovers the difference in horizons within one pedon. able to use lab equipment	Describing the characteristics of the appearance of the Earth's surface	Describe Different Samples, Doing various Lab works exercises	
5	2theory	E3: student should be able to deal efficiently in the field of work to transfer knowledge and skill to farmers	In one area poly pedon	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz Participation during lecture and Monthly exams
	3 practical	C6: the student Examine the tools Used to examine Soil pedon. D3: The student Should be able to Communicate his Information with the community .	spatial and environmental description of the area surrounding the soil pedon	Describe Different Samples, Doing various Lab works exercises	
6	2 theory	D1: acquiring the Communication Skills to deal with confidence and certainty at the Individual and Group level. D3: The student Should be able to communicate his Information with the community	Diagnostic characteristics of genetic horizons in soil pedon	Listening, Data show Using white board for Writing and drawing, discussion with students	
	3 practical	C6: The student practices measuring some of the physical and chemical characteristics of the pedon in the field	large and small morphological characteristics	Describe Different Samples, Doing various Lab works exercises	
7	2theory	A3: The student learns about the most important diagnostic horizons D1: acquiring the Communication Skills to deal with Confidence and certainty at the Individual and	Distinctive external diagnostic horizons, their types and characteristics	Listening, Data show Using white board for Writing and drawing, discussion with students	

		Group level			
	3 practical	C6: The student practices measuring some of the physical and chemical characteristics of the pedon in the field	Special formations in the soil pedon	Describe Different Samples, Doing various Lab works exercises	
8	2theory	A2: The student becomes familiar with the most important factors affecting the formation and development of the pedon B1: Practical and mental knowledge and to help student's in soil morphology	Distinctive internal diagnostic horizons, their types and characteristics	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz Participation during lecture and Monthly exams
	3 practical	C3: the student Should be prepare Scientific research and studies in his Field of specialization .	Epipedon diagnostic horizons	Describe Different Samples, Doing various Lab works exercises	
9	2theory	B9: the student is Familiar with the Most important Features that appear on surface and subsurface horizons C3: the student Should be prepare Scientific research and studies in his Field of specialization .	The relationship of the distinctive diagnostic horizons to the main and secondary horizons in soil beds and the conditions of their formation	Listening, Data show Using white board for Writing and drawing, discussion with students	
	3 practical	C6: student discovers any distinguishing Horizons, and able to use lab and field Equipment .	micro morphological characteristics	Describe Different Samples, Doing various Lab works exercises	
10	2theory	A1: The student explains the		Listening, Data show Using white board for	Quiz Participation during lecture

		concept of soil morphology B1: Practical and mental knowledge and to help student's in soil morphology	Geological Weathering and Pedogenic	Writing and drawing, discussion with students	and Monthly exams
	3 practical	C6: student discovers any distinguishing Horizons, and able to use lab and field Equipment. E3: student should be able to deal efficiently in the field of work to transfer knowledge and skill to farmers	Preparing thin section of soil Samples	Describe Different Samples, Doing various Lab works exercises	
11	2theory	A21: The student Should be able to describe weathering stages in the field	Products of weathering and formation of clay minerals under different conditions	Listening, Data show Using white board for Writing and drawing, discussion with students	
	3 practical	C25: test soil kinds In the lab under Varies slope level.	Study of pedons on slopes	Describe Different Samples, Doing various Lab works exercises	
12	2theory	A2: The student becomes familiar with the most important factors affecting the formation and development of the pedon A22: student should be able to interpret the secondary symbol Which show in the natural soil horizon	Different climatic conditions in the formation of morphological characteristics within pedons	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz Participation during lecture and Monthly exams
	3 practical	C6: student discovers any distinguishing Horizons, and able to use lab and field equipment .	field survey with the choice pedons	Describe Different Samples, Doing various Lab works exercises	
13	2theory	C3: the student Should be prepare		Listening, Data show Using	

		Scientific research and studies in his Field of specialization	Micromorphology, its concepts and components	white board for Writing and drawing, discussion with students	
	3 practical	C6: student discovers Any distinguishing Horizons, and able to use lab and field equipment	Different soil tests at different horizons and climatic conditions	Describe Different Samples, Doing various Lab works exercises	
14	2theory	B1: Practical and mental knowledge and to help student's in Soil morphology C6: student discovers Any distinguishing Horizons, and able to use lab and field equipment	Types of fine morphological characters, such as cutaneous ones, and their classes according to location, components, and internal composition(s), Fabric, and their dividing boundaries.	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz Participation during lecture and Monthly exams
	3 practical	C3: the student Should be prepare Scientific research and studies in his Field of specialization	Field visits to different soils and distinguishing them from each other	Describe Different Samples, Doing various Lab works exercises	
15	2theory	C6: student discovers any distinguishing Horizons, and able to use lab and field equipment C3: the student Should be prepare Scientific research and studies in his Field of specialization	Presentation of slides on large and small morphological characters	Listening, Data show Using white board for Writing and drawing, discussion with students	
	3 practical	D3: The student Should be able to Communicate his Information with the community	A scientific trip for the purpose of collecting soil samples from different sites	Describe Different Samples, Doing various Lab works exercises	

Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

	Evaluation method	Deadline	Grade	Relative weight	
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Final report	At the end of semester	Theory 3 Practical 3	6%
Quiz	Week 4	Theory 2 Practical 2	4%
First exam	Week 6	Theory 10 Practical 5	15%
Second exam	Week 14	Theory 10 Practical 5	15%
Final exam (practical)		20	20%
Final exam (theory)		40	40%
Total		100	100%

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil management and conservation
Main references (sources)	USDA
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	



Dr. khaled Anwer Khaled
Theoretical subject teacher



Ms. Reem Waleed Abduljabar
Practical subject teacher



Dr. Abdul Qader Abash
Chair of the Scientific Committee




Dr. Khaled Anwer Khaled
Head of the Department

Course Description Form

1. Course Name:					
Drainage					
2. Course Code:					
DRAI 355					
3. Semester / Year:					
Second Semester 2025/2026					
4. Description Preparation Date:					
5555555555/2/2026					
5. Available Attendance Forms:					
In presence + on line					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 Theoretical +3 Practical / 4 Unit					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Faris Akram Salih Al-Wazzan Nour Jamal Hussein Email: dr.farisakram@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	1- Preparing students who have the ability to use modern drainage methods and describe these methods accurately with the possibility of using them within Iraqi soils, which represent calcareous soils... and integrating these methods with irrigation networks and getting rid of excess water..... 2- Entering the agricultural sector with distinguished efficiency through participation. In puncture projects, modern irrigation techniques, and the use of the best methods in order to reduce water use within agricultural lands and reduce the risk of salt and desertification... 3- Directing students towards a desire to obtain better experiences when applying for postgraduate studies				
9. Teaching and Learning Strategies					
Theoretical: -Interactive lecture -Brainstorming -Dialogue and discussion -Assigning tasks and reporting -Presentations of models of irrigation drainage networks			Practical: - Assigning group work to reveal leadership skills - Assigning tasks and reporting for each experiment - He is assigned to prepare a report entitled from his own diligence and prepare it for discussion with Students		
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2 Theoretical 3 Practical	Theoretical: a1 : Explains the concept to the student water drainage practical : a1: Enabling the student to understand the topic of water drainage	Theoretical: The concept of drainage and the introduction to water drainage practical : Introduction to water drainage	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
2	2 Theoretical 3 Practical	a2 : Shows students signs Water drainage problems appear practical : a2 : Enable the student to know the benefits of draining	theoretical: Signs of water drainage problems practical : Water drainage purposes	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
3	2 Theoretical 3 Practical	Theoretical: a3: Explains to the student the concepts of water movement practical : a3 : Shows the student investigative methods	theoretical: Movement of water in the soil and missing equations Her own practical : Exploratory investigations	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
4	2 Theoretical 3 Practical	Theoretical: a4 : Explains to the student Solve movement problems Ground water practical : a4: Explains methods of investigation and detection of drainage	Theoretical: Solutions to groundwater movement problems practical : Design investigations	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
5	2 Theoretical 3 Practical	Theoretical: b1 : Enabling the student to Solve the relaxation equation practical : b1: Shows the student the use of drawing scale	Theoretical: Derivation of the relaxation equation with examples practical : Drawing scale	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
6	2 Theoretical 3 Practical	Theoretical: a5: Shows the student the importance Flow network practical :	Theoretical: Flow network practical :	theoretical: Audio methods style Writing on the board	Conduct daily examinations. Assignment and discussions

		Empower and understand conductivity	Methods for measuring the conductivity of saturated water. Laboratory methods	Direct dialogue style practical : Adapt tasks and reports	
7	2 Theoretical 3 Practical	Theoretical: b2: Enabling the student to Understanding the Hoggart equation practical : b2 : Explains methods for measuring conductivity in the field	Theoretical: Hockhart's equation to calculate the distance between trocars practical : Methods for measuring saturated water conductivity: field methods above the groundwater level	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
8	2 Theoretical 3 Practical	Theoretical: a6 : Explains to the importance of the equation for the unstable state of water practical : a6 : Explains the foundations of measurement under groundwater	Theoretical: Clover Dam equation for unsteady state water drainage practical : Methods for measuring saturated water conductivity: field methods below the groundwater level	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
9	2 Theoretical 3 Practical	Theoretical: b3 : Shows the stud student the imp importance Forchheimer equation practical : b3 : Enable the student to understand the types of water drainage	Theoretical: Forchheimer equation with examples and derivation practical : Types of water drainage	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
10	2 Theoretical 3 Practical	Theoretical: b4 : the student can Knowing the calculation of the diameters of trocar tubes practical : b4 : Explains to the student the importance of covered trocars	Theoretical: Calculating the diameter of water drainage pipes practical : Covered trocars	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
11	2 Theoretical 3 Practical	Theoretical: b5: The student shows Calculate the additional water to wash away the	Theoretical: Laundry requirements with examples	theoretical: Audio methods style	Conduct daily

		salts practical : b5: Shows student the methods Add water to wash away the salts	practical : Calculating the amounts of water added for Laundry requirements	Writing on the board Direct dialogue style practical : Adapt tasks and reports	examinations. Assignment and discussions
12	2 Theoretical 3Practical	Theoretical: b6 : Shows Add water to wash away the salts practical : b6 : Explains the effect of salinity on water drainage	practical : The effect of salts on soil and water Theoretical: Methods of maintaining trocar networks	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
13	2 Theoretical 3Practical	Theoretical: a7 : Shows the student methods of maintaining trocars practical : a7 : Explains maintenance methods	Theoretical: Methods of maintaining trocar networks practical : Maintenance concepts for trocars	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
14	2 Theoretical 3Practical	Theoretical: b7: Shows methods for designing trocars practical : b7: Demonstrates practical design	theoretical: Methods and design of modern trocars practical : Use programming to design trocars	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions
15	2 Theoretical 3Practical	theoretical: b8 : Demonstrates the design of trocars practical: b8 : Shows the student a complete comparison of the types of trocars	Theoretical: Design of open and covered trocars practical : Comprehensive comparison of open and covered trocars	theoretical: Audio methods style Writing on the board Direct dialogue style practical : Adapt tasks and reports	Conduct daily examinations. Assignment and discussions

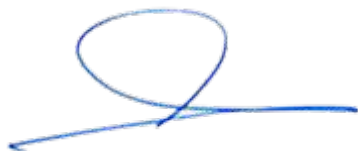
11. Course Evaluation

Relative weight %	Degree	Calendar appointment (weekly)	Calendar methods	ت
13%	7 Theoretical + 6 practical	Theoretically week (15) Practically week 1-15	Theoretical final report + practical experience reports	1
6 %	4+ Theoretical 2 practical	week (3)	Quiz(1)	2
15%	10 Theoretical+ 5 practical	week (9)	Exam Midterm (Theoretical and practical)	3

6%	4 + Theoretical 2 practical	week (12)	Quiz(2)	4
20%	20	Practical exam week	Final practical test	5
40%	40	Theory exam week	Final theoretical test	6
100%	100		Total	

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Drainage...D. Mohsen Al-Alamy
Main references (sources)	Irrigation and drainage book by Dr. Laith K
Recommended books and references (scientific journals, reports...)	SSSJ , WATER J .
Electronic References, Websites	https://doi.org/10.2136/sssabookser5.1.2ed



Dr. Faris akram salih Al-Wazzan

Theoretical teacher



Nour Jamal Hussein

Practical teacher



Abdul Qadir Abash Al-Hadidi
Head of the scientific committee



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

Course Description Form

Course Name:					
Soil Mineralogy					
Course Code:					
SOMI356					
Semester / Year:					
Second semester/Third stage/2025–2026					
Description Preparation Date:					
1/2/2026					
Available Attendance Forms:					
In-person + online					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical +3 practical /3 units					
Course administrator's name (mention all, if more than one name)					
Name: Assistant Prof.dr. Abdalkader Absh Sbak Email:dr.abdalkaderabshsbak@uomosul.edu.iq Name: Ghada Ahmed Mohammed Email : ghadaalhasme@uomosul.edu.iq					
Course Objectives					
- The learner should be able to understand and understand the relationship between the crystal and its systems and axes. - Enable the student to know the structural composition of silicate minerals - Enabling the student to understand and know the most important structural properties of minerals - Identify the transformations that occur in clay minerals - Enable the student to become familiar with the most important methods for detecting and distinguishing clay minerals and the special parameters for diagnosing soil minerals. - Enable the student to identify the crystalline structure of minerals - Identifying the surface charges of clay separations - Measurement of variable and fixed charges on clay surfaces					
Teaching and Learning Strategies					
Interactive lecture Brainstorming Dialogue and discussion Field Training Practical exercises Field project Self-education					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical	A1: The student learns about the most important rocks that make up the Earth's crust B1: The student distinguishes between types of rocks (igneous, sedimentary, metamorphic) B2: The student distinguishes between chemical and physical weathering	Mineral composition of the Earth's crust	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3practical	C1: The student collects different soil samples C2: Grinds and sieves soil samples C3: Prepares soil samples for mineral analysis	Preparing soil samples For civil analysis	Interactive lecture,brainstorming,dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
2	2Theoretical	A2: The student identifies the main parts of the crystal C1: The student describes the crystal axes with a diagram	Crystal structure of minerals	Interactive lecture, brainstorming, dialogue and discussion,self-learning	Semester exam 1, final exam
	3practical	C4: The student uses the siphon method to separate clay from other materials	Clay separation	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
3	2Theoretical	A3: The student differentiates between crystalline systems by the number of faces, axis length, and interfacial angles A4: The learner distinguishes between the cubic, hexagonal, triangular, monoclinic, and triangular systems.	Crystal systems	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C5: The learner uses distilled water to wash the soil of salts	Removal of dissolved salts	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
4	2Theoretical	B3: The student employs the relationship between the arrangement of atoms that make up a metal crystal A5: It determines the type of joint, strength and hardness of the metal	Structural composition of minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: The student removes carbonate minerals using HCL A1: The learner uses a hydrogen peroxide solution to remove organic matter	Removal of calcium carbonate And organic matter	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
5	2Theoretical	A6: The student is familiar with the most important rules that control the distribution of ions in the minerals of the Earth's crust B4: The student distinguishes silicate minerals based on the type of structural unit	Structural structure of silicate minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3practical	C6: The student uses DCB to remove iron oxides from clay separators	Removal of iron oxides	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
6	2Theoretical	B5: The student judges the type of clay mineral from the soil separation B6: The student distinguishes primary from secondary minerals by their resistance to weathering	Soil minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	B1: The student examines clay slices with an X-Ray machine	Preparing clay strips for a purpose Examination	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
7	2Theoretical	A6: The student differentiates between silicate minerals by the number of tetrahedral and octahedral units	Silicate minerals	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project, self-learning(scientific visit to the College of Earth Sciences)	Field project (scientific visit to the College of Earth Sciences)
	3practical	A2: The student uses X-ray diffraction technology in mineral analysis	Mineralogical analysis of clay	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
8	2Theoretical	B6: The student distinguishes silicate minerals from non-silicate minerals through silicon dioxide	Non-silicate minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	A3: Clay minerals are classified through magnesium impregnation and air drying A4: Clay minerals are classified through treatment by saturation with magnesium and treatment with ethylene glycol A5: Clay minerals are classified through treatment by saturation with potassium and air drying A6: Clay minerals are classified during treatment by saturation with potassium and heating at 350°C. A6: Clay minerals are classified during treatment by saturation with potassium and heating at 550°C. A6: The student determines the type and percentage of clay minerals in the soil sample	Practical applications for diagnosis Calculating the proportions of clay minerals	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1

9	2Theoretical	A6: The student is aware of the importance of clay minerals C2: The student judges the structural composition by the number of tetrahedral and octahedral units	Clay minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	A6: The student uses the washing and sedimentation method to separate sand A6: The learner uses an optical microscope to view crystals of different colors and sizes.	Sand separation	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
10	2Theoretical	A6: The student classifies clay minerals into crystalline and amorphous B6: The student distinguishes expanded clay minerals by the crystal dimension of 18 μm	Division of clay minerals	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	A6: The student uses bromoform to separate coarse sand from fine sand	Separation of sand minerals Light to heavy	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
11	2Theoretical	A6: The student classifies kaolinite minerals as non-expanding minerals C3: The student distinguishes kaolinite minerals by 7- μm reflectance	Clay minerals 1:1	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	C6: The student uses Canada Balsam to stabilize sand grains	Preparing sand slices For analysis	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
12	2Theoretical	A6: The student classifies smectite minerals as expanded minerals C4: The student distinguishes smectite minerals by 14- μm reflectance	Clay minerals 1:2(expanded)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	A6: The student learns about the type of charges through delamination curves	Estimating standing shipments For soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
13	2Theoretical	C5: Mica appears as a hexagonal shape under an electron microscope C6: The student distinguishes mica minerals by their lamellar structure	Clay minerals 1:2 (unexpanded)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3practical	A6: The student distinguishes variable charges from permanent charges by the degree of interaction of the medium	Estimating variable charges For soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
14	2Theoretical	A6: The student recognizes the mineral chlorite in the presence of the brucite layer B6: The student distinguishes the mineral chlorite by constant reflection in all parameters at 14 enkstrom	Clay minerals 1:1:2	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	B6: The student examines iron oxides extracted using chelating materials	Determination of iron oxides College in the soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1
15	2Theoretical	B6: The student judges the transformation of clay minerals by hydrothermal reactions and weathering	Clay mineral transformations	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3practical	A6: The student uses an XRF device to examine crystalline iron oxides	Determination of iron oxides Crystallized in soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test1

Course Evaluation

	Calendar methods	Calendar date (week)	degree	Relative weight %	
1	Report 1	fourth week	brother	2.5	
2	Report 2	The fifth week	brother	2.5	
3	Short test (1) Quiz	the sixth week	a	2	
4	Short test (2) Quiz	The fourteenth week	a	2	
5	Short test (3) Quiz	The fifteenth week	1	1	
6	Semester test (1)	the sixth week	H.K	7.5	
7	Semester test (2)	The eleventh week is difficult	H.K	7.5	
8	Final theoretical test	Final semester exams	40	40	
9	Practical field project	The fifteenth week	Kh	5	
10	Field evaluation	The third and fifth week	a	2	

11	Practical short test (1) Quiz	The first week	1	1
12	Short practical test (2) Quiz	fourth week	0.kh	0.5
13	Short practical test (3) Quiz	The fourteenth week	1	1
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12 and 13	Kh.kh	5.5
15	Final practical test	Final semester exams	20	20
	total	100	100%	%100

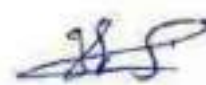
Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil Chemistry book, written by Dr. Kazem Mashhout 1986
Main references (sources)	
Recommended books and references (scientific journals, reports...)	The book (Soil Minerals) written by Prof. Dr. Salman Khalaf Issa
Electronic References, Websites	



dr.Abd Alkader Absh Sbak

Theoretical subject teacher



Ghada ahmed Mohammed

Practical subject teacher



dr.Abd Alkader Absh Sbak

Chairman of Scientific Comm ittee



dr.Khaled Anwer Khaled

Head of the Department



Course description form

1.	Course Name:	Natural resource economics
2.	Course Code:	REEC490
3.	Semester/Year: Annual	First semester/fifth stage Rabaa/ 2025-2026
4.	Date this description was prepared	1 / 2 / 2026
5.	Available attendance forms:	In person
6.	Number of study hours (total)/number of units (total):	2 theoretical hours / 3 practical hours (5 hours) / 3 units
7.	Name of the course administrator (if more than one name is mentioned)	Dr: Rehal Sobhe Qasem Hussamaldeen Danon Ali
8.	Course objectives	- Enabling the student to learn about natural resources, their types and their importance - Empowering the student How to exploit Natural Resources In an optimal way and explain uses - Enable the student to recognize On land, human and water resources - Empowering the student To learn about ways Preserving these resources and the demand supply for them
9.	Teaching and learning strategies	- Interactive lecture - Brainstorming - Dialogue and discussion - Field Training - Practical exercises - Field project - Self-education
10.	Course structure	

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and	Research methods in economic resources	A1: Learn about the methods and methods used to study and explore economic resources	2Theoretical	1

	discussion, self-learning				
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	The importance of the reasons for studying it Geological depletion Economic depletion	A2: Learn about the concept of natural resources	3 Practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Characteristics of economics Economic Resources - Classification of economic resources	B1: Explains the characteristics of economic resources C1: Enumerates resource classifications	2 Theoretical	2
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Basic functions For Earth	A3: Enumerates the functions of the earth	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Economics of land resources - concepts and characteristics of land - uses of land - use capacity - best use of land	A4: Learn how to use the land C2: Determine the best methods to use	2	3
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Light cutting and advantages of light farming Dense reduction and the advantages of dense agriculture The difference between a dense border and a light border	C3: Compare between the dense border and the light border	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Land use density - factors Influential in the density of land use -	A5: Understands how population density is distributed A6: He knows how to plan to	theoretical	4

			distribute resources fairly		
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Economic supply response For land due to changing demand	B2:Explains the economic offer	Practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Display of land resources - concept of land - natural supply - economic supply - . Means of increasing the economic supply of land	B3:YimmigBetween the natural and economic supply of the land C4Compares the different options available for land use	theoretical	5
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	A graph of supply and demand from society's point of view and how equilibrium is achieved	B4:Explains the theory of supply and demand in selling from society's point of view	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Land rent - characteristics of rent - types of agricultural land rent - Theories of rent - the economic and social importance of rent	B5:He knows the definition of rent C5It shows the types of rent	theoretical	6
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	A graph of supply and demand from an individual's point of view and how equilibrium is achieved	B6:Explains the theory of supply and demand in selling from the individual's point of view	practical	
Semester exam	Semester exam	Semester exam	Semester exam	2	7
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Traditional resources, their types and features, and unconventional resources, their types and features	C6: Compares traditional and non-traditional German resources	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue	Evaluation of agricultural land resources - evaluation requirements - factors affecting the value of land	B7: It is clear Factors affecting agricultural land values	theoretical	8

	and discussion, self-learning	- Earth straightening methods	C7Methods of evaluating land, how to use it, and determining the best ways to use the land		
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Diagram of the water balance and means of maintaining the quantity and quality of water resources	B8:It shows the balance between supply and demand for water	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Tenure of agricultural land resources - the concept of agricultural tenure - types of tenure -.	The concept of tenure explains the factors influencing the use of land C8:And evaluate the effectiveness of agricultural policies	theoretical	9
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Strong and weak condition for sustainable development	C9:Compares the strong and weak condition for sustainable development	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Characteristics of land tenure – Importance of land tenure resources- Lands of the Arab world countries-Arable lands For agriculture The floorArab agricultural -	C10Determines the needs of the farmer And he plans toMake plans for toDevelopment of the agricultural sector	theoretical	10
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Natural capital stock stability chart	B9:It shows the stability of the natural capital stock	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Agricultural land resources in Iraq - divisions of Iraqi lands - per capita share of arable land	A7::Knows terrestrial resources Its types and importance And understanding the challenges facing agriculture in Iraq	theoretical	11

Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	The optimal point and future justifications for achieving it	B10:It shows the optimum point for the size of the capital stock	Practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Economics of human resources - population size - population size and economic activity - population density -	A8::Understands the importance of human resources, analyzing decisions and developing management skills	theoretical	12
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Supplier of capital and its sources	B11:Explains capital resources	practical	
Semester exam	Semester exam	Semester exam	Semester exam	Semester exam	13
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Characteristics of human resources management	B12:Explains human resources management	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Agricultural workforce - human resources in Iraq.	A9:Recognize definitionsbasics related to itIt helps develop workforce skills	theoretical	14
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Characteristics of capital resources	B13:Shows intellectual capital	practical	
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Economics of water resources - the importance of water resources - sources of water resources in Iraq - fish wealth	B14Knows water resources, their importance, and their distribution sources	theoretical	15
Semester exam 1, final exam	Interactive lecture, brainstorming, dialogue	Examples of capital resources	B15:Gives examples of capital resources	Practical	

	and discussion, self-learning				
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Theoretical subject teacher

Course evaluation .11				
	Relative weight%	Class	Calendar date (week)	Calendar methods
	52.	52.	the third week	Short test(1 Quiz)
	20	20	the sixth week	Theoretical semester test
	2.5	2.5	The ninth week	Short test(Quiz2))
	40	40	Final semester exam	Final theoretical test
	2.5	2.5	The first week	A short practical test(1) Quiz
	5.2	2.5	fourth week	A short practical test(2) Quiz
	10	10	the sixth week	Practical semester test
	20	20	Final semester exams	Final practical test
	100%	100%		the total
Learning and teaching resources .12				
Land economics and reformagricultural,Dr. Ab Khaleq Muhamn			Required textbooks (methodology, if any)	
The Economics of Agrarian Reform, Dr. Ab Wahab Matar Al-Dahri			Main references (sources)	
Economics of Natural and Environmental Resource Dr. Hamad bin Muhammad Al-Sheikh			Recommended supporting books and references (scientific journals, reports....)	
nothing			Electronic references, Internet sites	

Dr: Rehal Sobhe Qasem

Hussamaldeen Danon Ali

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

Dr. Abdul Qader Abash
Chair of the Scientific Committee



Course description form

1. Module Title					
Soil Survey and Classification					
2. Module Code :					
SOSC448					
3. Season \Year					
First Season (Autumn) 2025–2026					
4. Scientific Committee Approval Date					
1\9\2025					
5. Available attendance forms:					
Presence					
6. Number of study hours (total)/ Namer of units (total) :					
2 Theoretical , 3 Practical = 4 unit					
7. Module Leader					
Asst. prof. Yousif H. Alnaser alnaseryousif10@uomosul.edu.iq M. Ghada Ahmed ghadaalhasme@uomosul.edu.iq					
8. Module Aims					
- Identify the physical and chemical properties of soil that are important in the study of soil survey and classification. 2 - Clarifying and explaining the nature of the relationship between physical and chemical characteristics of soils and the emergence and classification of soils. 3- Learn about international soil classifications, especially the American classification of soils according to Soil Texa. - Possibility of classifying soils according to the modern American system to a sub-group level.					
9. Learning and Teaching Strategies					
- Interactive lecture -Brainstorming -Dialogue and discussion -Field Training -Practical exercises -Field project -Interactive lectures -Brainstorming					
10. Material Covered					
Assessment Method	Learning Method	Module Name	Learning Outcomes Requirements	Hrs	Week
Quiz and Assignment	Audio method Slideshow	Soil Survey terms	a1 -understand Soil and Classification terms	2 Theoretical	1
	Writing lecture report	The importance of studying soil surveys from a pedagogical perspective	a2 -learns pedagogical aspect of survey	3 Practical	

Quiz and Assignment	Audio method Slideshow	Soil formation factors and types of surveys	a1 - understand Soil formation factors	2 Theoretical	2
	Writing lecture report	Personal characteristic that a surveyor should possess	b1-proficient duties and skills of survivor	3 Practical	
Quiz and Assignment	Audio method Slideshow	Soil classification Soil classification	a2 -learns pedagogical aspect of survey	2 Theoretical	3
	Writing lecture report	Goals and purposes and soil survey grades	b2 -masters aims and purposes of surveys	3 Practical	
Quiz and Assignment	Audio method Slideshow	Soil classification systems in the world: Russian soil classification systems	a2 -identifies pedological aspect of the survey.	2 Theoretical	4
	Writing lecture report	Tools required for soil surveying	b3 -classifies the tools used in the field	3 Practical	
Quiz and Assignment	Audio method Slideshow	Canadian, UN and International Soil Classification System	a2-learns pedolical aspect of survey	2 Theoretical	5
	Writing lecture report	Preparing and interpreting soil maps	c1-uses soil map interpretation	3 Practical	
Quiz and Assignment	Audio method Slideshow	American soil classification systems	a2-learns pedolical aspect of survey	2 Theoretical	6
	Writing lecture report	Stages of implementing	c2 -schedules the stages of soil surveys	3 Practical	
Quiz and Assignment	Audio method Slideshow	Identify and name taxonomic units	b1 -masters naming of taxonomic units	2 Theoretical	7
	Writing lecture report	Field units of land Soil Maps	c3 -predicts the field units	3 Practical	
Quiz and Assignment	Audio method Slideshow	Soils order according to Soil Taxonomy	b2 -masters soil classification levels	2 Theoretical	8
	Writing lecture report	Soil Maps	b4- proficient in creating soil map	3 Practical	
Quiz and Assignment	Audio method Slideshow	Entisols order and Vertisols order	a2 -learns pedagogical aspect of survey	2 Theoretical	9
	Writing lecture report	cartographic units	b4 -masters use of drawing scales	3 Practical	
Quiz and Assignment	Audio method Slideshow	Aridisols Order, Inceptisols Order	a2 -gets to know Aridisols and Inceptisols	2 Theoretical	10
	Writing lecture report	Drawing scales	c3 -employs remote sensing technology in soil mapping	3 Practical	
Quiz and Assignment	Audio method Slideshow	Mollisol	a2 -gets to know Mollisol Orders	2 Theoretical	11

	Writing lecture report	Soil maps used in surveying and classifying soils	c3 -employs remote sensing technology in soil mapping	3 Practical	
Quiz and Assignment	Audio method Slideshow	Alfisosls	a2 -gets to know Alfisosls Orders	2 Theoretical	12
	Writing lecture report	Sources of measured distances	c4-uses various types of surveys and measures area on map	3 Practical	
Quiz and Assignmen t	Writing report about scientific trip	Scientific trip	c1 -explains methods of land classification and area measurement	Practical	13
Quiz and Assignment	Audio method Slideshow	Ultisols Order, Spodosols Order	a2 -gets to know Ultisols and Spodosols Orders	2 Theoretical	14
	Writing lecture report	Soil survey reports, Iraqi and international	d1-distinguishes between survey report and compares them nationally	3 Practical	
Quiz and Assignment	Audio method Slideshow	Oxisols & Histisols	a2 -gets to know Oxisols & Histisols Orders	2 Theoretical	15
	Writing lecture report	Applications of soil surveys in Iraq	d2-discusses applications of soil survey in Iraq	3 Practical	
11. Course evaluation					
Weight (Marks)	Grade 100	Week Due	Assignments		
13 %	4 Theoretical 6 Practical	Theoretical 15 week Practical 15 week	Final report		1
6 %	4 Theoretical 2 Practical	3 week	Short Quiz (1)		2
15 %	10 Theoretical 5 Practical +	9 week	Midterm		3
6 %	4 Theoretical 2 Practical	12 week	Short Quiz (2)		4
20%	20	1 week Practical exam	Final Exam Practical		5
20%	40	1 week	Final Exam Theoretical		6
12. Learning and Teaching Resources					
Soil survey and classification, Ahmed Saleh Muhammed			Required Texts		

Fundamentals of Pedology, Walid Al-Aqidi	Basic Texts
Academic scientific journals, reports of international organizations on land management and evaluation	Recommended Texts
• Conservation Service in cooperation with The University of Hawaii Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C. • Service in cooperation with Hawaii Institute of Topical Agriculture and Human Resources.	Websites



Asst. prof. Yousif H. Alnaser
Theoretical subject teacher:



Ghada Ahmed mohamed
Practical subject teacher



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




Dr. Abdul Qader Abash
Chair of the Scientific Committee

Course Description Form/ Soil and Water conservation

1. Course Name:					
Soil and water conservation					
2. Course Code:					
WASC449					
3. Semester / Year:					
First semester/2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
Life in person + Virtual					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 + 3= 75 Hr / 3 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. khaled Anwer khaled Assi.Lectu. Reem Waleed Alsafar					
8. Course Objectives					
Course Objectives - Enable the student to understand and comprehend what is related to soil and water conservation and its relationship to soil science and water resources - Enable the student to know the most important methods of soil maintenance and water harvesting - Enable the student to become familiar with the most important water sources - Empowering the student with the ability to detect types of water and wind erosion -The student can control erosion and preserve the soil from erosion - Enabling the student to become familiar with the most important laboratory methods for estimating erosion and erosion and detecting soil loss rates and their factors.					
9. Teaching and Learning Strategies					
- Interactive lecture - Brainstorming - Dialogue and discussion - Assigning tasks and reporting - Presentations of examples of sites degraded by erosion					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 virtual	A1: Learn about the concept of soil and water conservation, its benefits, and an introduction and definition of land degradation by water and wind.	Introduction to conservation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, exam

	3 Laboratory	C1: The student will examine the tools for measuring rain amounts and be able to design scientific experiments by applying modern technologies.	Analysis of rainfall data	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	2 virtual	C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	The topic of Precipitation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
2	3 Laboratory	C1: The student will examine the tools for measuring rain amounts and be able to design scientific experiments by applying modern technologies. D19: The student discovers any soil degradation caused by water and is able to deal with water sources, soil and other agricultural natural resources.	Rainfall rate		Direct drawing
	2 virtual	A2: The student is familiar with the most important factors affecting water erosion	Run off		Semester exam 1, final exam
3	3 Laboratory	C1: The student will examine the tools for measuring rain amounts and be able to design scientific experiments by applying modern technologies.	Depth of rainfall		Field evaluation
	2 virtual	A2: The student is familiar with the most important factors affecting water erosion B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification and climate change.	Rainfall data analysis		Semester exam 1, final exam
4	3 Laboratory	D24: The student interprets quantitative information from formulas, graphs, tables, plans, simulations,	Examples of soil and water conservation	Interactive lecture, brainstorming, dialogue	Practical quiz 2, direct drawing

		and visualizations, draws conclusions from that information, and represents it symbolically, visually, and numerically.		and discussion, self-learning	
5	2 virtual	D1: That the student practices various thinking skills in a systematic and positive manner in diagnosing the problems and issues he faces while working and proposing appropriate solutions to them. E1: The student proposes ways to preserve the environment and natural resources and preserve the soil from grazing	Surface runoff in soil	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Laboratory	C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food. D24: The student interprets quantitative information from formulas, graphs, tables, plans, simulations, and visualizations, draws conclusions from that information, and represents it symbolically, visually, and numerically.	The rational method for calculating the loss	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
6	2 virtual	A24: The student exercises the factors affecting erosion in the field and explains the principles of planning and implementing agricultural operations and appropriate scientific methods in soil and water treatment. D1: The student practices various thinking skills in a systematic and positive manner in diagnosing the problems and issues he faces while working and proposing appropriate solutions to them.	Forms of water erosion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3 Laboratory	C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food. B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification, and climate change.	The CN method in calculating the flow	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework
7	2 virtual	A1: Learn about the concept of soil and water conservation, its benefits, and an introduction and definition of land degradation by water and wind B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification and climate change.	The most important methods of surface and subsurface runoff	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 2, final exam
	3 Laboratory	C1: The student examines the tools for measuring rainfall amounts and is able to design scientific experiments by applying modern technologies. C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	Kinetic energy KE	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Field project
8	2 virtual	A2: The student is familiar with the most important factors affecting water erosion B9: The student explains the most important methods of movement of plankton and sediments as a result of water erosion, and suggests ways to analyze data and information and interpret agricultural phenomena using applied programs to	Mechanics of water erosion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 2, final exam

		solve the problem of erosion.			
	3 Laboratory	C2: The student should be able to prepare scientific research and studies in his field of specialization. C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	General equation for soil loss	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework
9	2 virtual	A1: Learn about the concept of soil and water conservation, its benefits, and an introduction and definition of land degradation by water and wind C2: The student should be able to prepare scientific research and studies in his field of specialization.	Erosion and soil productivity		Semester exam 2, final exam
	3 Laboratory	C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	Calculating the erosion susceptibility factor of rain	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework
10	2 virtual	B9: The student explains the most important methods of movement of plankton and sediments as a result of water erosion, and suggests ways to analyze data and information and interpret agricultural phenomena using applied programs to solve the erosion problem. C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	Controlling water erosion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester test2
	3 Laboratory	C2: The student should be able to prepare scientific research and studies in his field of specialization. D19: The student discovers any soil degradation caused	Soil erosion susceptibility factor using the nomograph method	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework

		by water and is able to deal with water sources, soil and other agricultural natural resources.			
11	2 virtual	B9: The student explains the most important methods of movement of plankton and sediments as a result of water erosion, and suggests ways to analyze data and information and interpret agricultural phenomena using applied programs to solve the erosion problem. C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	USLE Calculation Methods	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final test
	3 Laboratory	C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food. D19: The student discovers any soil degradation caused by water and is able to deal with water sources, soil and other agricultural natural resources.	Topographic factor calculations in LS erosion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework
12	2 virtual	A1: Learn about the concept of soil and water conservation, its benefits, and an introduction and definition of land degradation by water and wind. A2: The student is familiar with the most important factors affecting water erosion	The concept of wind erosion and its risks	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final Test
	3 Laboratory	B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification, and climate change. C25: The student should be able to implement water	Calculate the weighted rate of dry soil loss, MWD	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework

		harvesting projects and good agricultural practices to maximize productivity to obtain safe food.			
13	2 virtual	A2: The student is familiar with the most important factors affecting water erosion B9: The student explains the most important methods of movement of plankton and sediments as a result of water erosion, and suggests ways to analyze data and information and interpret agricultural phenomena using applied programs to solve the erosion problem.	Mechanics of wind erosion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final Exam
	3 Laboratory	C6: The student examines the tools used to examine soil C25: The student should be able to implement water harvesting projects and good agricultural practices to maximize productivity to obtain safe food.	Calculate the weighted rate of loss of wet soil (MWD).	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework
14	2 virtual	B9: The student explains the most important methods of movement of plankton and sediments as a result of water erosion, and suggests ways to analyze data and information and interpret agricultural phenomena using applied programs to solve the erosion problem.	Controlling wind erosion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
	3 Laboratory	B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification, and climate change. C2: The student should be able to prepare scientific research and studies in his field of specialization. C25: The student should be able to implement water harvesting projects and good agricultural practices to	Crop management factor calculations	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test3

		maximize productivity to obtain safe food.			
15	2 virtual	C2: The student should be able to prepare scientific research and studies in his field of specialization B9: The student explains the most important methods of movement of plankton and sediments as a result of water erosion, and suggests ways to analyze data and information and interpret agricultural phenomena using applied programs to solve the erosion problem.	Maintenance applications necessary to maintain productivity	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
	3 Laboratory	B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification, and climate change. D24: The student interprets quantitative information from formulas, graphs, tables, plans, simulations, and visualizations, draws conclusions from that information, and represents it symbolically, visually, and numerically.	Calculating the agricultural uses factor.	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Field project

Course Evaluation				
No	Evaluation methods	Evaluation date	Grade	Relative weight
1	Report 1	fourth week	2.5	2.5
2	Report 2	The fifth week	2.5	2.5
3	Short test (1) Quiz	the sixth week	2	2
4	Short test (2) Quiz	The fourteenth week	2	2
5	Short test (3) Quiz	The fifteenth week	1	1
6	Semester test (1)	the sixth week	7.5	7.5
7	Semester test (2)	The eleventh week is difficult	7.5	7.5
8	Final theoretical test	Final semester exams	40	40
9	Practical field project	The fifteenth week	5	5
10	Field evaluation	The third and fifth week	2	2
11	Practical short test (1) Quiz	The first week	1	1
12	Short practical test (2) Quiz	fourth week	0.5	0.5
13	Short practical test (3) Quiz	The fourteenth week	1	1
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12 and 13	5.5	5.5
15	Final practical test	Final semester exams	20	20
	Total	100	100%	%100

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Soil management and conservation
Main references (sources)	USDA
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	



Assi. Prof. Dr. Khaled Anwer khaled



Assi. Lectu. Reem Waleed Alsafar




Assit. Prof. Dr. Abdul kader Abash sbak



Assi. Prof. Dr. Khaled Anwer khaled

Head of Scientific Member

Head of Department

Course Description Form

1. Course Name:					
Soil Microbiology					
2. Course Code:					
SOMI450					
3. Semester / Year:					
First fall semester / 2025–2026					
4. Description Preparation Date:					
1\ 9 \ 2025					
5. Available Attendance Forms:					
In presence					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical + 3 practical / 3 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Rand Abdalhade Gazal Assist. Lecturer. Alia Abdul Latif Jassim					
8. Course Objectives					
theoretical 1- Enabling the student to know the microorganisms in the soil 2- Identify the phenotypic characteristics of organisms in the soil 3- Learn how to diagnose bacteria 4- Introducing the student to the role of microorganisms present in the soil 5- Trying to enhance the student's skills in diagnosing and counting bacteria			Practical Enabling the student to count microorganisms in Soil and learning about the most important methods of sterilization Phenotypic and biochemical diagnosis For bacteria and fungi		
9. Teaching and Learning Strategies					
Theoretical - Interactive lecture - Brainstorming - Dialogue and discussion - Assigning reports - Conducting monthly and daily examinations			Practical Interactive lecture -Discussion, dialogue, brainstorming -Conducting laboratory experiments -Assigning reports - Conducting daily and monthly examinations		
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	Theoretical a1 The student demonstrates a concept Microbiology from the soil	theoretical Historical overview, definition of microorganisms, study of soil microbiology	Interactive lecture, brainstorming, dialogue and discussion, self-learning	theoretical audio methods, Writing on the board Direct dialogue style

	3 practical	Practical b3 Taking soil samples and preparing slides	Practical Methods of taking soil samples for microbial studies, studying the function of microorganisms using the buried slide method	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
2	2 Theoretical	Theoretical b1 The student explains the most important sections of soil microbiology	Theoretical Sections of soil microbiology	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical c5 Counting microorganisms from the soil	Practical Estimating the numbers of bacteria, fungi, and actinomycetes at depth Different types of soil and method Serial dilutions (dilution and counting in dishes)	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
3	2 Theoretical	Theoretical a2 Identifying microbial groups	Theoretical Soil microbial groups, Bacteria, fungi, algae, actinomycetes, archaea, Mycorrhizal fungi	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical a10 Isolation of algae and protozoa from the soil	Practical Count and isolate algae and protozoa from the soil	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
4	2 Theoretical	Theoretical c1 A study on the role of microorganisms in the decomposition of organic matter and the enzyme activity of microorganisms	Theoretical Organic matter: carbon cycle, enzymatic activity in soil	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical e1 Determination of bioanalysis of organic matter and measurement of its quantity CO ₂ and carbon from soil	Practical Measuring the speed of decomposition of organic compounds with different percentages of carbon and nitrogen in different soils	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
5	2 Theoretical	Theoretical a3 Recognize transformations Nitrogen bioavailability and microorganisms that decompose it Urea	Theoretical Biological transformations of nitrogen: nitrogen cycle, urea hydrolysis, nitrification process	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical c6 Detection of the process of converting ammonium into ammonia then to nitrite and nitrate	Practical Study of nitrogen transformations and detection of urea, nitrite and nitrate from soil	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
6	2 Theoretical	Theoretical c2 The student explains how it is done mineralization and nitrogen assimilation	Theoretical Nitrogen mineralization, nitrogen metabolism, C/N ratio	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical a11 The student learns how Isolation of root nodule-forming bacteria	Practical Isolation of root nodule Bacteria from different leguminous plants	Interactive lecture, brainstorming, dialog and discussion, field	practical Assigning tasks and reports

				training, practical exercises, field project self-learning	
7	2 Theoretical	Theoretical a4 The student is aware of the importance of nitrogen-fixing microorganisms	Theoretical Biological nitrogen fixation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical a12 The student reveals numbers Azotobacter bacteria from the soil	Practical Estimating the numbers of Azotobacter bacteria Azotobacter from different soils by counting the most likely MPN	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
8	2 Theoretical	Theoretical b2 The student judges the role Microorganisms that convert phosphorus	Theoretical Biotransformations of phosphorus: its cycle and the role of microorganisms in its transformations	Interactive lecture, brainstorming, dialogue and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical c7 The student reveals numbers Bacillus bacteria	Practical Estimating the number of Bacillus bacteria Isolate it from the soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
9	2 Theoretical	Theoretical a5 The student learns about the role microorganisms that transform sulfur	Theoretical Biotransformations of sulfur: a role Sulfur, its mineralization, representation Microbial, oxidative stress	Interactive lecture, brainstorming, dialogue and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical c8 The student detects bacteria Which oxidizes sulfur from the soil	Practical Detection of oxidizing bacteria for sulfur from soil	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
10	2 Theoretical	Theoretical c3 Determine which student you are doing By reducing inorganic sulfur compounds	Theoretical Reduction of inorganic sulfur compounds	Interactive lecture, brainstorming, dialogue and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical c9 The student examines the neighborhoods that... It quenches soil aggregates	Practical Estimation of microorganisms in the composition of soil aggregates	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
11	2 Theoretical	Theoretical a6 The student learns about the role Microorganisms that transform iron	Theoretical Biotransformations of iron: oxidation and reduction, decomposition of iron compounds membership	Interactive lecture, brainstorming, dialogue and discussion, self-learning	theoretical audio methods, Writing on the board direct dialogue style
	3 practical	Practical c11 The student is tested on iron-oxidizing bacteria and a method Isolate her	Practical Isolation of iron-oxidizing Bacteria and estimate their numbers	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
12	2 Theoretical	Theoretical	Theoretical Decomposition of pesticides in soil	Interactive lecture, brainstorming, dialogue and discussion,	theoretical audio methods, Writing on the board

		a7 The student explains the relationship between microorganisms		self-learning	Direct dialogue style
	3 practical	Practical c11 The student reveals the nitrogen-fixing microorganism leguminous plants	Practical The effect of some pesticides on organisms Microscopic soils, especially economic ones	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
13	2 Theoretical	Theoretical c4 The student learns about an activity Microbiology in The area near the roots Which is known as the rhizosphere	Theoretical The relationship between microorganisms: The area surrounding the roots rhizosphere	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board Direct dialogue style
	3 practical	Practical c12 The student reveals the bacteriophage	Practical Studying the properties of root nodule bacteria and then multiplying them and conducting inoculation experiments with their leguminous plants	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
	2 Theoretical	Theoretical a8 The student is familiar with the role of microorganisms in decomposition of pesticides	Theoretical Activity of microorganisms in the rhizosphere	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board Direct dialogue style
	3 practical	Practical c13 The student reveals the microorganisms that decompose pesticides	Practical A study on bacteriophage in Some the soil	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports
15	2 Theoretical	Theoretical a9 The student learns about the most important Factors affecting growth Microbiology	Theoretical Factors affecting the growth of organisms Microscopic	Interactive lecture, brainstorming, dialog and discussion, self-learning	theoretical audio methods, Writing on the board Direct dialogue style
	3 practical	Practical c14 The student reveals nematodes and how to isolate them from the soil	Practical Methods of isolating nematodes from soil	Interactive lecture, brainstorming, dialog and discussion, field training, practical exercises, field project self-learning	practical Assigning tasks and reports

11. Course Evaluation

	Evaluation	Time of evaluation	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 (methodology, if any)				
Main references (sources)	Soil Microbiology, 1989, written by Dr. Ghayath Muhammad Qasim and Dr. Mud Abdul Salam Ali MICROBIOLOGICAL APPLICATIONS, 2007 Alfred E. Brown			
Recommended supporting books and references (scientific journals, reports....)	Bergey's manual of systematic bacteriology			
Electronic references, Internet sites				



M. Dr.. Rand Abdel Hadi Ghazal
Theoretical subject teacher:



Alia Abdul Latif Jassim
Practical subject teacher



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




Dr. Abdul Qader Abash
Chair of the Scientific Committee

Course Description Form

1. Course Name:	
Hydrology and water resources	
2. Course Code:	
HYWR452	
3. Semester / Year:	
First semester – Autumn/ fourth stage / –2025–2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Theory 2 – practical 3 /3 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Omar Nabhan Abdulqader Email: umarn79@uomosul.edu.iq Noor Jamial Hussien	
8. Course Objectives	
Course Objectives Improve the student's ability in water sciences and hydrology and management of water resources. -increase the student's skills in term of water sciences -improve the student's ability to dealing with different hydrological data and its application in agricultural and soil sciences	Practical Study the hydrological cycle, rainfall, evaporation, infiltration, initial loss, surface run off , ground water , hydrograph , flooding and rain water harvesting
9. Teaching and Learning Strategies	
Strategy Reactive lectures Critical thinking Discussion Require to do Several Homework's and Write scientific report for different task during the semester	Practical: group work and cooperation among students. -learn various academic skills. -Do Homework, discussion in the lab and exercise related to hydrology and water resources

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theory	A1: identify The elements of hydrological Cycle A2: explain impact Of climate Change and Human activity On water cycle	Water cycle	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	A1: study of Water Properties B1: distribution Of hydrological; Cycle in 3 different climate Zones.	Water Properties and Flow path of Hydrological Cycle	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
2	2 theory	A3: Mechanism of rainfall formation. A4: Type of precipitation and Rainfall intens	Rainfall Formation	Listening Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	B2: Calculate average rainfall using Thiessen polygon method B2: Calculate average rainfall using isohyetal lines method	Calculate average rainfall over specific area	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
3	2 theory	C1: Draw the relation Between rainfall Depth and area under different Intensity. B1: Design and probability	Area-depth – Duration of Rainfall	Listening Data show Using white board for Writing and drawing, discussion with students	Quiz, Participation during lecture and Monthly exams

		Of maximum Rainfall			
	3 practical	B3:15 solve Mathematical Problem isohyetal lines method B4: solve Mathematical Problem Thiessen polygon method	Exercise of Calculated Average Rainfall	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
	2theory	A3: explain and Determine Of effective Rainfall C1: Analysis the Factors effect on Effective Rainfall	Effective rainfall And factors effect on it	Listening Data show Using white board for Writing and drawing, discussion wi students	Quiz , Participation during lecture and Monthly exams
4	3 practical	C2: Analysis Of rainfall Probability B1: apply to determine return Period for rainfall.	Probability And return period	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
5	2theory	A4: Normal and acid rainfall quality A4: interception and depression storage	Rainfall water Quality, interception and initial Loss from Precipitation	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	B2: calculate Frequency of Of rainfall B3:determine rainfall intensity	Draw and Calculate Rainfall Intensity	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
6	2 theory	A4: Evaporation From surface Water body and Soil A4 : listed the Factors effect On evaporation Rate .	Evaporation and factors Effect on it	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams

	3 practical	B4: Calculate Miss rainfall Data B5: Analysis Double mass Cure method	Calculate Miss rainfall Data	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
7	2theory	C2: the relation Between Infiltration And surface Runoff B2: Evaluation The factors Effect of infiltration Into the soil	Infiltration of Water into the Soil	Listening, Data show Using white board for Writing and drawing, discussion wi students	Quiz , Participation during lecture and Monthly exams
	3 practical	B1: using Different Evaporation equations C1: Mathematical Exercise about Evaporation	practical different method to calculate evaporation	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
8	2theory	C3: Watershed Properties Such as drainage Pattern, stream Length and Stream order C4: draw and Determine the Boundary of Watershed	Properties Of watershed	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz, Participation during lecture and Monthly exams
	3 practical	B2: using Infiltration index Equation C1: Mathematical Exercise about Determine Infiltration Index	Determine Infiltration Index	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
	2theory	A4 : describe Surface runoff And it types B2: Analysis the Factors effects On surface	Surface runoff	Listening, Data show Using white board for Writing and drawing, discussion	Quiz , Participation during lecture and Monthly exams

9		runoff		with students	
	3 practical	C1 determine of properties Waters on and calculate Stream order B2: Determine The water Divide and Drainage density And drainage Pattern	Morphometric Analysis For Watershed	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
10	2theory	B3: Study and Evaluation Of hydrograph and It parts. B4: Separate and Analysis hydrograph Parts	Hydrograph	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	B2: Analysis hydrograph Data B3: determine Amount of Discharge and recharge between river and ground water.	Dealing with hydrograph Data	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
11	2theory	A3: explain Porosity and permeability Of rocks and it Related to ground Water A4: Methods Of drilling wells and pumping Test analysis	Ground water And wells	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	B3: plot The locations Of wells and Springs, drawing Water level maps B1: Determine The rate of ground Water flow and estimate The amount of aquifer storage	Determine Ground water Level in wells	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams

12	2theory	C4: reason of flood and factor effect on it. B3: Analysis Of flood data	Flooding and Analysis Of flow Duration Curve	Listening, Data show using white board for Writing and drawing, discussion with students	Quiz, Participation during lecture and Monthly exams
	3 practical	C2: Exercise About flow Duration curve C2: Analysis Discharge data During flood and Drought period	Analysis Of flood data	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
13	2theory	A1: properties and types of Water harvesting A3: advantage and disadvantage Of water Harvesting	water Harvesting	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	B1: Mathematical Exercise about Rainfall water harvesting B2: Mathematical Exercise about Runoff water harvesting	Exercise about Harvesting	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
14	2theory	C3 : different Type of water Footprint B1 : using Footprint in Agricultural	Water Footprint	Listening, Data show using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams
	3 practical	A2: define Virgin flow A2: Mathematical Exercise about virgin flow	Virgin flow	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
	2theory	C2: Interaction Between Surface Water and ground Water B2: conserve and good Management Water Resources	Integration Of surface And ground Water Management	Listening, Data show Using white board for Writing and drawing, discussion with students	Quiz , Participation during lecture and Monthly exams

15	3 practical	C1:Field trip to Mosul Dam and Some sites of irrigation Project.	Field trip to Mosul dam	Describe Different Samples, Doing various Lab works exercises	Quiz , Participation during lecture and Monthly exams
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11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

Evaluation method	Deadline	Grade	Relative weight
Final report	At the end of semester	Theory 3 Practical 3	6%
Quiz	Week 4	Theory 2 Practical 2	4%
First exam	Week 6	Theory 10 Practical 5	15%
Second exam	Week 14	Theory 10 Practical 5	15%
Final exam (practical)		20	20%
Final exam (theory)		40	40%
Total		100	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering hydrology author: Basal Alrawi
Main references (sources)	Hydrology in practices (2011)Author Shaw E.M , Beven K.J, Chappell N.A
Recommended books and references (scientific journals, reports...)	Hydrology journal
Electronic References, Websites	USGS website

Dr. Omar Nabhan abdulqader

Theoretical subject lecturer

Mrs. Noor Jamial Hussien

practical subject lecturer

Dr.AbdulQader Abash Sabak

Chairman of scientific committee



Dr. Khaile anwar Khalid

Head of the Department of soil and water resources

Course Description Form

Course Name:					
Irrigation systems technologies					
Course Code:					
AGSW24_F4061					
Semester / Year:					
First semester / 2025 –2026					
Description Preparation Date:					
1 \ 9 \ 2025					
Available Attendance Forms:					
presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 Theoretical 3 practical/ 4 units					
Course administrator's name (mention all, if more than one name)					
Name: Dr. Rana Saadallah Aziz Name: A.T. Noor jamal Hussien					
Course Objectives					
– The student will be able to identify the factors involved in selecting an irrigation method. – The student will be able to identify the factors associated with irrigation water. – The student will be able to understand surface irrigation methods. – The student will be able to calculate the amount of irrigation water added.			– The student will be able to identify the types of irrigation methods – The student is able to identify the components and traceability of the irrigation network – The student can follow and see the irrigation facility – The student will be able to identify the forms of surface irrigation. – The student is able to understand and observe the method of sprinkler irrigation – The student is able to understand and follow the drip irrigation method.		
Teaching and Learning Strategies					
- Interactive lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting			practical: - Assigning group work to reveal leadership skills - Assigning tasks and reports		
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 practical	Theoretical Factors for choosing the appropriate irrigation method	Theoretical 1 The student understands how to choose the appropriate irrigation method.	theory: Blackboard with field observations practical :	Short exams, assignments, discussions

		Practical: a1 student understands different irrigation methods - traditional methods and modern methods	Practical Different ways of adding water	Using the blackboard and field observations	
2	2 Theoretical 3 practical	a2 The student understands the irrigation water factors related to the choice of irrigation method. practical : a2The student understands what the unit consists of: the crops, the farm, and the field	theory: Irrigation method factors related to irrigation water practical : Irrigation unit	theory: Blackboard and field observations practical : Using the blackboard and field observations	Short exams, assignments, discussions
3	2 Theoretical 3 practical	Theory: a3 The student understands the forms and methods of surface irrigation. Practical: a3The student is familiar with the forms of surface irrigation, and what is basin irrigation	theory: Surface irrigation practical : basin irrigation	theory: Watching videos with explanations on the board practical : Using the blackboard and field observations	Shortexams, assignments, discussions
4	2 Theoretical 3 practical	Theory: b1 The student understands the forms and advantages of flood irrigation. practical : b1 It enables the student to understand and estimate the depth and volume of water added to the basin	theory Flood irrigation practical : Irrigation terraces, free flooding, and the student's estimation of the depth of irrigation water using the basin method	theory: Using the whiteboard while watching YouTube Practical: Use the blackboard and assign reports	
5	2 Theoretical 3 practical	Theory: a4 The student understands what basin irrigation is, its advantages and limitations. Practical: a4 The student understands strip irrigation	Theoretical: Basin irrigation and its advantages Practical: Strip irrigation	Theoretical: Watch posters practical : Use the whiteboard and watch posters	
6	2 Theoretical 3 practical	Theoretical: B2 The student will be able to understand the features of contour basins.	Theoretical Contour basins	Theoretical: View a poster using the board.	

		practical : b2 The student is able to learn about the advantages and devices of sprinkler irrigation	practical : Sprinkler irrigation	practical : Field views and posters	
7	2 Theoretical 3 practical	Theoretical: d1 The student understands the estimation of water concentration within the soil. d1 practical : The student is able to estimate the drainage required for a sprinkler irrigation system	Theoretical: Estimating the rate of soil infiltration of water practical : Sprinkler irrigation system capacity	Theoretical: Performing some calculations and reports Practical: Examples of blackboard assignment and report	First examination
8	2 Theoretical 3 practical	theory: d2 The student understands what free irrigation is and what its advantages are. Practical: d2 The student is able to know the sprinkler discharge and irrigation time	theory: Flood irrigation practical : Single spray capacity	Theoretical: Scenes of some posters Practical: Examples of blackboard assignment and report	
9	2 Theoretical 3 practical	Theoretical: d3 Enable the student to apply certain ratios to determine irrigation time and the volume of water added. practical : d3 The student will be able to estimate sprinkler drainage and irrigation systems	Theoretical Estimating the basin irrigation period practical : Capacity of one sprinkler for a rectangular field	Theory: Using the board practical : Use the blackboard and assign a report	Short exams, homework assignments, discussions
10	2 Theoretical 3 practical	Theoretical: Theory: d4 The student understands what strip irrigation is and its advantages. practical : d4 The student is able to estimate the uniformity of water distribution in the field	Theoretical: : Strip irrigation practical : Correlation coefficient	Theoretical: Using the whiteboard with the poster practical : Example solutions with field observations	Short exams, homework assignments, discussions
11	2 Theoretical 3 practical	Theoretical: d5 The student distinguishes the stages of strip irrigation.	Theoretical: Stages of strip irrigation practical :	Theoretical: Illumination using the board practical :	exams, homework assignments, discussions

		practical: d5 The student will be able to estimate the depth of water applied by sprinkler irrigation	Applications in correlation coefficient	Assigning tasks and reporting	
12	2 Theoretical 3 practical	Theory: d6 The student will be able to design a strip irrigation system. Practical: d6 The student is able to calculate the depth of irrigation water and the discharge of the sprinkler nozzle	Theoretical: Designing a strip irrigation system Practical: Estimating the percentage of losses for sprinkler irrigation	Theoretical: Using the board practical : Using the whiteboard while assigning a report	Short exams, homework assignments, discussions
13	2 Theoretical 3 practical	Theoretical: b3 The student learns about the nature of the furrow and its features. practical : b3 The student understands the characteristics of drip irrigation and estimates the correlation coefficient	Theoretical: Furrow irrigation practical : Drip irrigation	Theoretical: Using the board practical : Use the whiteboard with field views and assignments	Short exams, homework assignments, discussions
14	2 Theoretical 3 practical	Theoretical: b4 The student understands the construction of a drip irrigation system and its advantages. practical: b 4The student is able to understand the shape of the water distribution below the dripper. Estimating the drainage of the dripper	Theoretical: Drip irrigation practical : Theoretical definition of drips	Theoretical: blackboard planning practical : Assigning tasks and reporting	Second examination
15	2 Theoretical 3 practical	Theoretical: . b5 The student understands the advantages of sprinkler irrigation, and what the capacity of the system is. practical : b5 The student is able to understand the problem of blockages and bottlenecks occurring in the drip irrigation network	Theoretical: Spring irrigation practical : Types of blockages and bottlenecks in the drip irrigation network	Theoretical: Illustration of a diagram on the board practical : Preparing some chemical solutions in the laboratory	Short exams, homework assignments, discussions
Course Evaluation					

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	irrigation and drainage (Prof. Dr. Laith Khalil Ismail)
Main references (sources)	Irrigation, its basics and applications (Dr. Nabil Ibrahim Latif)
Recommended books and references (scientific journals, reports...)	Rafidain Journal of Agriculture
Electronic References, Websites	https://www.iasj.net



Theoretical subject teacher Name: Dr. Rana Saadallah Aziz



practical subject teacher: A.T. Noor jamal Hussien




Department Head: Khalid Anwar khalid



Chairman of the Scientific Committee: Abdel Qader Abash Sabak

Course Description Form – Graduation Research Project 2

Course Name:					
Graduation Research Project 2					
Course Code:					
REPR403					
Semester / Year:					
Second (Spring) Semester 2025/2026					
Date of Preparation of This Description					
1/9/2025					
Available Forms of Attendance:					
In-person + Online					
Number of Study Hours (Total) / Number of Units (Total):					
3 practical / 1 unit					
Name of the Course Administrator (state all names if more than one):					
Name : Osama Hossam Fadel					
Course Objectives					
Enabling the student to understand and comprehend how to select a title for the graduation research project Enabling the student to learn the most important methods of compiling topics for writing the graduation research project Enabling the student to become familiar with how to select the topic of the graduation research project Enabling the student to acquire the ability to write the graduation research project The student will be able to judge the importance of the graduation research project topic through analysing its components Enabling the student to learn how to collect the sources for writing the graduation research project					
Teaching and Learning Strategies					
Theoretical Interactive lecture Brainstorming Dialogue and discussion Assignment of tasks and reports Field training					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Topic Name	Learning Method	Evaluation Method

First	3 practical	b1: The student identifies the sources required for selecting the title of his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Second	3 practical	c1: The student discusses the procedure of writing the components of the graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Third	3 practical	b2: The student reviews the supporting features for delivering the presentation of the graduation research project in the best form	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Fourth	3 practical	a1: The student identifies the factors that make his/her delivery of the graduation research project simple, comprehensible, and clear	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Fifth	3 practical	c2: The student gives examples of the most important results obtained in his/her seminar	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Sixth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment

Seventh	3 practical	c3: The student determines the most important scientific points supporting his/her seminar	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Eighth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Ninth	3 practical	a1: The student identifies the factors that make his/her delivery of the graduation research project simple	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Tenth	3 practical	a1: The student identifies the factors that make his/her delivery of the graduation research project comprehensible and clear	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Eleventh	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Twelfth	3 practical	c2: The student states the most important results obtained in the graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Thirteenth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment

Fourteenth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Fifteenth	3 practical	c3: The student determines the most important scientific points supporting his/her seminar	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment

Course Evaluation

No.	Evaluation Methods	Evaluation Date (Week)	Mark	Relative Weight %
1	Final theoretical report + practical experiment reports	Theoretical: Week 15 Practical: Weeks 1–15	7 theoretical + 6 practical	13%
2	Quiz 1	Week (3)	4 theoretical + 3 practical	6%
3	Midterm Exam (theoretical and practical)	Week (9)	10 theoretical + 5 practical	15%
4	Quiz 2	Week (12)	4 theoretical + 2 practical	6%
5	Final practical exam	Practical examinations week	20	20%
6	Final theoretical exam	Theoretical examinations week	40	40%
	Total		100	100%

Learning and Teaching Resources

Required Prescribed Textbooks (curricular, if any)	Lectures, research papers, theses, and dissertations related to the graduation research project
Main References (Sources)	
Recommended Supporting Books and References (scientific journals, reports, etc.)	
Electronic References and Internet Websites	Websites



Osama Hossam Fadel
Course Instructor



Asst. Prof. Dr. Abdulqadir Abash Sabak
Head of the Scientific Committee



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

Course description form

1.	Course Name:
	Seminars
2.	:Course Code
	SEMN404
3.	Semester/Year: Annual
	Second Spring Semester 2025/2026
4.	Date this description was prepared
	1/9/2026
5.	Available forms of attendance:
	In person + Electronic
6.	Number of study hours (total)/number of units (total)
	Theoretical number of hours (30)/ number of units (2)
7.	Name of the course administrator (if more than one name is mentioned)
	Teacher: Reem Waleed Alsafar
8.	Course objectives
	1. Enabling the student to understand and comprehend how to choose a seminar title. 2. Enabling the student to know the most important methods for compiling seminar writing topics. 3. Enabling the student to master how to choose a seminar topic. 4. Enabling the student to develop seminar writing skills. 5. The student can judge the importance of the seminar topic by analyzing the topic's vocabulary. 6. Enabling the student to learn how to collect sources for writing a seminar.
9.	Teaching and learning strategies
	- Theoretical - Interactive Lecture - Brainstorming - Dialogue and Discussion - Assignment and Report
10.	Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
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1	2 Theoretical	b1: The student identifies the sources needed to choose the title of his seminar.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
2	2 Theoretical	c1: The student discusses the vocabulary writing procedure. The seminar	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
3	2 Theoretical	b2: The student reviews the supported features to best present his seminar presentation.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
4	2 Theoretical	a1: The student learns the things that make his method of delivering his seminar simple, understandable, and clear.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
5	2 Theoretical	c2: The student gives examples of the most important results obtained in the special seminar.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
6	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
7	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
8	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
9	2 Theoretical	a1: The student learns the things that make his method of delivering his seminar simple.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
10	2 Theoretical	a1: The student learns the things that make his method of delivering his seminar clear and understandable.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
11	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation

12	2 Theoretical	c2: The student mentions the most important results achieved in his/her course.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
13	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
14	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation
15	2 Theoretical	c3: The student identifies the most important scientific points that support his/her study session.	Seminar discussion	interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student evaluation

11. Course evaluation

Evaluation methods		Calendar appointment	Grade 100	Relative weight
1	Final theoretical report on soil degradation and its assessment, as well as soil management methods. Final practical report on practical lessons and field visits.	Theoretical week 15 Practical week 1-15	7 Theoretical 6 Practical	13%
2	Quiz (1)	Week 3	4 theoretical + 2 practical	6%
3	Mid. exam (theoretical and practical)	Week 9	10 theoretical + 5 practical	15%
4	Quiz (2)	Week 12	4 theoretical + 2 practical	6%
5	Final practical exam	Practical exam week	20	20%
6	Final theoretical exam	Theoretical exam week	40	20%

12. Learning and teaching resources

Required textbooks)methodology)if any	Lectures, research papers, theses, and dissertations related to the seminar
Main references (sources)	
Recommended supporting books andreferences scientific journals, reports	
Electronic references, Internet sites	Websites



Subject teacher

Reem Waleed Alsafar

Head of Department

Ph.Dr. Khalid Anwer Khalid

Chairman of the Scientific Committee

Ph.Dr. Abdalkader Absh Sbak

Course Description Form – Computer Applications 4

1. Course Name:
Computer Applications 4
2. Course Code:
COMA401
3. Semester / Year:
First semester / Fourth stage / 2025–2026
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total):
3 practical hours / 2 units
7. Course administrator's name (mention all, if more than one name):
Name: Najla Matti Isaac Email: najla.matti@uomosul.edu.iq

8. Course Objectives
• Enable the student to become familiar with the SAS statistical program and its applications in agricultural experiments. • Enable the student to know and understand programs in the SAS language and apply the steps and procedures followed to use the SAS statistical program in analyses of agricultural experiments. • Enabling the student to write programs in the SAS language for various agricultural and scientific experiments. • Providing the student with the skills of dealing with data types when writing programs in the SAS language. • Enabling the student to correct grammatical and linguistic errors that appear when implementing programs written in the SAS language. • Enable the student to read, understand and interpret the results and outputs of implementing programs written in SAS.

9. Teaching and Learning Strategies	
Strategy	- Interactive lecture - Brainstorming

	- Dialogue and discussion - Field training - Practical exercises - Field project - Self-education
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3 practical	A1: Introducing the student to the SAS program, its importance and its use in statistical analysis of data and the tools available in it.	What is the SAS program – storing and retrieving information – modifying and programming data – writing reports – statistical analysis – processing records	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
2	3 practical	B1: The student learns about the windows of the SAS program, the purpose of each window, and how to deal with them, and is familiar with the general matters that people who want to use the SAS program should have for the purpose of statistical analyses.	SAS windows – writing and loading the program window – program execution steps window – results window. Who uses SAS software? Why SAS – general matters that people who want to use SAS software for the purpose of statistical analysis should have in mind.	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
3	3 practical	C1: Able to know, understand and practically apply the general steps of writing a SAS program.	General steps for writing a SAS program.	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
4	3 practical	D1: Is able to know, understand, and practically apply the use of functions, their importance, and formulas for using	Functions	Interactive lecture, brainstorming, dialogue and discussion, practical	Quiz, practical test, homework, semester

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
		them in writing a program in the SAS language.		exercises, and self-learning.	test, final test.
5	3 practical	D2: Able to know, understand, and practically apply new data from the input data set using mathematical operations or functions and the formulas for using them in writing a program in the SAS language.	Create new data from an input data set using mathematical operations or functions.	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
6	3 practical	D3: Able to know, understand and practically apply to create data using conditional IF statements and the formulas for using them in writing a program in the SAS language.	- Generate data using IF conditional statements. + Scientific visit.	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
7	3 practical	D4: Able to know, understand and practically apply the use of conditional statements to delete data from a data set and the formulas for using them in writing a program in the SAS language.	- Using conditional statements to delete data from the data set in the program + Semester exam 1	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
8	3 practical	D5: Able to know, understand, and practically apply sorting and arranging data and the formulas for using them in writing a program in the SAS language.	- Sorting and arranging data - Use the PROC SORT statement	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
9	3 practical	D6: Able to know, understand, and practically apply to	- Applications in descriptive statistics	Interactive lecture, brainstorming,	Quiz, practical test,

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
		find a one-way and two-way frequency distribution tables and their use formulas in writing a program in the SAS language.	- One-way frequency distribution table - Two-way frequency distribution table - PROC FREQ	dialogue and discussion, practical exercises, and self-learning.	homework, semester test, final test.
10	3 practical	D7: Able to know, understand, and practically apply to find average and dispersion measures and formulas for using them in writing a program in the SAS language.	- Measures of central tendency and measures of dispersion. - PROC MEANS	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
11	3 practical	D8: Able to know, understand and practically apply T-test formulas and their use in writing a program in the SAS language.	- Test of means and analysis of variance - t-test	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
12	3 practical	D9: Able to know, understand and practically apply to find the analysis of variance table for balanced data and the formulas for using it in writing a program in the SAS language.	- Analysis of variance formula - PROC ANOVA	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
13	3 practical	D10: Able to know, understand, and practically apply to find a variance analysis table for unbalanced data and formulas for using it in writing a program in the SAS language.	- PROC GLM + Semester exam 2	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.
14	3 practical	D11: Able to know, understand and practically apply to find the correlation	- PROC CORR – correlation coefficient formula	Interactive lecture, brainstorming, dialogue and	Quiz, practical test, homework,

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
		coefficient and the formulas used in writing a program in the SAS language.		discussion, practical exercises, and self-learning.	semester test, final test.
15	3 practical	D12: Able to know, understand and practically apply to find the regression equation and formulas for using it in writing a program in the SAS language.	- PROC REG – regression formula	Interactive lecture, brainstorming, dialogue and discussion, practical exercises, and self-learning.	Quiz, practical test, homework, semester test, final test.

11. Course Evaluation

No.	Evaluation Methods	Evaluation Date (Week)	Grade	Relative Weight %
1	Final theoretical report + practical experiment reports	Theoretical: Week 15 Practical: Weeks 1–15	7 theoretical + 6 practical	13%
2	Short test (Quiz 1)	Week 3	4 theoretical + 2 practical	6%
3	Midterm exam (theoretical and practical)	Week 9	10 theoretical + 5 practical	15%
4	Short test (Quiz 2)	Week 12	4 theoretical + 2 practical	6%
5	Final practical test	Practical exams week	20	20%
6	Final theoretical exam	Theoretical exams week	40	40%
Total			100	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	A curriculum was prepared by computer professors at the college based on the SAS software guide.
Main references (sources)	- SAS software guide - A Handbook of Statistical Analyses using SAS (authors: Geoff Der and Brian S. Everitt) - Data analysis using the SAS statistical program, written by Dr. Firas Rashad Al-Samarrai

Recommended books and references (scientific journals, reports, ...)	Statistical analysis using the SAS package, prepared by: Abdullah Al-Shahrani
Electronic references, websites	https://www.sas.com/en_sg/training/offers/free-training.html https://video.sas.com/detail/videos/how-to-tutorials https://www.udemy.com/course/sas-programming-for-beginners https://sascrunch.com/courses/sas-base-programming-for-absolute-beginners-free-version/



Theoretical subject teacher:

Practical subject teacher: Najla Matti Isaac



Head of Department

Ph.Dr. Khalid Anwer Khalid



Chairman of the Scientific Committee

Ph.Dr. Abdalkader Absh Sbak

Course description form

1. Module Title					
Soil Management					
2. Module Code :					
SOMA454					
3. Season \Year					
Second Season (Autumn) 2025–2026					
4. Scientific Committee Approval Date					
1\ 2 \2026					
5. Available attendance forms:					
Presence					
6. Number of study hours (total)/ Namer of units (total) :					
2 Theoretical , 3 Practical = 3 units					
7. Module Leader					
Asst. prof. Yousif H. Alnaser alnaseryousif10@uomosul.edu.iq M. Roaa Raad					
8. Module Aims					
- The learner should be able to identify the important physical, chemical, biological, and environmental properties of soil that influence soil management. - Differentiate between soil assessment systems in terms of agricultural suitability and soil productivity. - Understand sound methods for managing agricultural soils. - Recognize the impact of good physical, chemical, and fertile soil properties in preventing soil degradation. - Understand the fundamentals of assessing the suitability and productivity of agricultural lands according to the type of crop being grown.					
9. Learning and Teaching Strategies					
- Interactive lecture, -Brainstorming, -Dialogue and discussion, -Field Training -Practical exercises					
10. Material Covered					
Assessment Method	Learning Method	Module Name	Learning Outcomes Requirements	Hrs	Week
Quiz and Assignment	Audio method Slideshow	relationship between management and other sciences	a1-learns concept of soil management and the terminology used.	2 Theoretical	1
	Writing lecture report	the importance of studying soil from a pedological perspective	a9- learns about management concept and the most important problems	3 Practical	

Quiz and Assignment	Audio method Slideshow	types and degrees of soil degradation	a2- learns about types of soil degradation	2 Theoretical	2
	Writing lecture report	deterioration of agricultural soils	b7- explores the types of deterioration and methods for assessing	3 Practical	
Quiz and Assignment	Audio method Slideshow	soil degradation: salinization, waterlogging, erosion	a3- covers soil salinization and waterlogging	2 Theoretical	3
	Writing lecture report	waterlogging	b8- explores the types of waterlogging	3 Practical	
Quiz and Assignment	Audio method Slideshow	soil degradation: 4- calcification 5- gypsum	a4 -identifies soil calcification and gypsum	2 Theoretical	4
Quiz and Assignment	Writing lecture report	calcification and gypsum	c2 -Identifies the types of calcareous and gypsum soils	3 Practical	
Quiz and Assignment	Audio method Slideshow	soil degradation: 6- impermeable layers, 7- surface conditions	a5- Identifies impermeable layers and soil conditions.	2 Theoretical	5
	Writing lecture report	soil surface conditions	b9- detects types of impermeable and soil surface conditions.	3 Practical	
Quiz and Assignment	Audio Slideshow	land valuation: 1- types of valuation 2- valuation methods	b1- land valuation, methods and types	2 Theoretical	6
	Writing lecture report	desertification	c3- natural indicators of desertification	3 Practical	
Quiz and Assignment	Audio method Slideshow	land suitability assessment 1- the storie index method	b2- student masters how to classify agricultural lands	2 Theoretical	7
	Writing lecture report	soil susceptibility and degradation	b10- discovers the land suitability	3 Practical	
Quiz and Assignment	Audio method Slideshow	agricultural suitability 2- suitability index	b3- student masters the assessment of land suitability	2 Theoretical	8
	Writing lecture report	soil suitability and water erosion	b11- discovers land suitability	3 Practical	
Quiz and Assignment	Audio method Slideshow	land valuation according to the viability index	b4- masters land evaluation according to suitability guide.	2 Theoretical	9
	Writing lecture report	agricultural soil susceptibility and wind erosion	c4- defines methods for improving land from wind erosion	3 Practical	

Quiz and Assignment	Audio method Slideshow	land assessment and classification	b5- proficient in assessing land suitability	2 Theoretical	10
	Writing lecture report	new earth problems	c5- distinguishes land suitability methods and land problems	3 Practical	
Quiz and Assignment	Audio method Slideshow	land evaluation according to productivity index	b6- proficient in classifying land productivity.	2 Theoretical	11
	Writing lecture report	fertilization and soil fertility	c6- distinguishes the soil's productivity and fertilization methods	3 Practical	
Quiz and Assignment	Audio method Slideshow	soil management methods:1- organic matter management	a6- identifying organic matter management methods	2 Theoretical	12
	Writing lecture report	organic matter	e1- determines the methods of managing	3 Practical	
Quiz and Assignment	Writing report about scientific trip	scientific trip	c6 - defines soil fertility and fertilization	Practical	13
Quiz and Assignment	Audio method Slideshow	soil management techniques: 2- tillage and operations	c1- soil management techniques, tillage operations	2 Theoretical	14
	Writing lecture report	distinguish tillage and service operations	c7- soil management and crop service	3 Practical	
Quiz and Assignment	Audio method Slideshow	soil management methods: 3- crop rotation	a7- familiarity with soil management and crop rotation	2 Theoretical	15
	Writing lecture report	crop rotation	b12- experiment with crop rotation	3 Practical	

11. Course evaluation

Weight (Marks)	Grade 100	Week Due	Assignments	
13 %	4 Theoretical 6 Practical	Theoretical 15 week Practical 15 week	Final report	1
6 %	4 Theoretical 2 Practical	3 week	Short Quiz (1)	2
15 %	10 Theoretical 5 Practical +	9 week	Midterm	3
6 %	4 Theoretical 2 Practical	12 week	Short Quiz (2)	4
20%	20	1 week Practical exam	Final Exam Practical	5
20%	40	1 week	Final Exam Theoretical	6

12. Learning and Teaching Resources	
Soil Management in Land Planning and Use, by Muhammad Khader Abbas	Required textbooks (methodology, applicable)
Principles of Pedology, Walid Al-Akeedi Soil Survey and Classification, Ahmed Saleh Muhaimid	Main References (Sources):
Academic scientific journals, reports of international organizations on land management and evaluation	Recommended Texts
• https://www.google.com/search • https://www.fao.org/soils-portal/soil-management/en/ • https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soil/soil-health/soil-health-management	Websites



Asst. prof. Yousif H. Alnaser
Theoretical subject teacher:



Roaa Raad
Practical subject teacher



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




Dr. Abdul Qader Abash
Chair of the Scientific Committee

Course Description

1. Course Title:
Desertification
2. Course Code
DESE455
3. Semester / Year:
Second Semester –2025-2026
4. Description Preparation Date:
1/2/2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours / Number of Units /
2 Theoretical 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hesham Saadaldeen Younis Email: Hesham293@uomosul.edu.iq
8. Course Objectives
1 - Identify desertification and what is its difference from the desert, through some definitions and scientific terms that explain this. 2 - Introducing the student to the meaning of desertification indicators, what they mean and their difference from other expressions. 3- Explaining the causes of desertification in some detail and teaching the student that mismanagement, in addition to climatic factors, are among the most important causes. 4- Introducing the student to the criteria for desertification and its degrees according to international standards 5- Introducing sand dunes as one of the most important manifestations of desertification. 6- Directing the student to methods of combating desertification in some countries according to the financial capabilities of each country.
9. Teaching and Learning Strategies
- Interactive Lecture - Brainstorming - Dialogue and discussion - Practical exercises - Assigning tasks and writing a report - Self-learning

1. Course Structure					
The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	A1. Teach students about the definitions of desertification, its difference from degradation, and what each word means	Concepts and definitions of desertification, land degradation and desert.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Homework Assignment of duty discussions
2	2 Theoretical	A2: Introducing the student that desertification is a global problem and guiding him to the most important areas affected by it	Desertification is a global problem in arid and semi-arid regions.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions
3	2 Theoretical	A3: Introducing the student to the causes of desertification and degradation .	Causes of desertification and land degradation.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions Homework
4	2 Theoretical	B1: The student learns about the processes that cause desertification and degradation	Desertification and land degradation processes.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Homework Assignment of duty discussions short test (1)
5	2 Theoretical	B2Introducing students to the degrees of desertification and the difference between each degree and another	Degrees and manifestations of desertification	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Homework Assignment of duty discussions Short test (2) Homework
6	2 Theoretical	A4: The student gets to know the approved standards By international organizations in assessing desertification	Standards approved by the FAO in assessing desertification	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Homework Assignment of duty discussions Short test (3)
7	2 Theoretical	A5: Creating a knowledge overview of land degradation and the impact of overgrazing and premature grazing	Degradation of pasture lands, overgrazing and early grazing	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions Semester test (1)
8	2 Theoretical	A5: Identifying sand dunes and distinguishing them from dust storms	Sand dunes and storms	Auditory methods Writing style on the blackboard Slideshow style	Short exams Assignment of duty discussions

				Interactive dialogue style.	Report 1
9	2 Theoretical	A7: Introducing the student to the types of sand dunes and how they are created	Types of sand dunes, their formation, and their division according to the speed of movement.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Homework Assignment of duty discussions
10	2 Theoretical	A8: The student learns the methods and methods of combating desertification	Ways and methods to combat desertification and reduce its risks	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions
11	2 Theoretical	A9: Forming the idea of mechanical methods in combating desertification.	Mechanical methods in combating desertification	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions Semester test (2)
12	2 Theoretical	A10: The student learns about chemical methods in combating desertification.	Chemical methods in combating desertification.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty Discussions Write a simplified report with quick testing
13	2 Theoretical	A11 The student learns about the biological methods in combating desertification and what are the benefits of afforestation.	Biomethods and afforestation Windbreaks in combating desertification	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions
14	2 Theoretical	A12: The student learns about the distribution of degrees of desertification and degradation in Iraq and places representative of these degrees	Distribution of degrees processes of desertification and land degradation in Iraq.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	Short exams Assignment of duty discussions
15	2 Theoretical	A13: The student learns about modern techniques in monitoring desertification, the most important of which is remote sensing.	Using remote sensing techniques to monitor and monitor the phenomenon of desertification.	Auditory methods Writing style on the blackboard Slideshow style Interactive dialogue style.	test Assignment of duty discussions

1. Course Evaluation

t	Evaluation methods	Calendar date (week)	Grade	% Relative Weight
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1	Report 1	The eighth week	5	5
2	Homework	the third week	1	1
3	Short test (1) Quiz	fourth week	1	1
4	Short test (2) Quiz	The fifth week	1	1
5	Short test (3) Quiz	the sixth week	1	1
6	Semester test (1)	The seventh week	7.5	7.5
7	Semester test (2)	The eleventh week is difficult	7.5	7.5
8	Final theoretical test	Final semester exams	60	60
9	Homework	The fifth week	1	1
10	Homework	the sixth week	1	1
11	Homework	The first week	1	1
12	Homework	fourth week	1	1
13	test	The fourteenth week	10	10
14	Homework	The ninth week	1	1
15	test	Final semester exams	1	1
	Total	100	% 100	%100

2. Learning and Teaching Resources

Desertification, Majid Khudair Abbas / Abdul Amir Thajil Saleh - University of Baghdad 2012	Required textbooks (methodology, if any)
	Main references (sources)
Academic scientific journals, reports of international environmental and weather organizations	Recommended books and references (scientific journals, reports...)
FAO	Electronic References, Websites



Theoretical subject lecturer:
Dr. Hesham Saadaldeen Younis



Chairman of the Scientific Committee
Dr. Abdul Qader Abash sbak





Head of the Department of Soil Science and Water Resources
Dr. Khaled Anwar Khaled

Course Description

Course Title:
Plant nutrition
Course Code
PLNU214
Semester / Year:
Second semester –2025-2026
Description Preparation Date:
1/2/2026
Available Attendance Forms:
In presence
/Number of Units Number of Credit Hours /
3 units Theoretical + 2Practical 2
Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Fatih Abid Hassan Email: fatihabid85@uomosul.edu.iq Assist. Lecturer: Reem Walid Al-Saffar
Course Objectives
Preparing students with the ability to work in the field of plant nutrition and the use of fertilizers according to the - modern scientific method to keep pace with the development in this field and entry into the agricultural sector efficiently by participating in agricultural projects. and processed. - Enable the student to diagnose the symptoms of nutrient deficiency on the plant - Enable the student to identify the methods of plant sampling, digestion and preparation for chemical analysis. - Introducing the student to the most important methods of measuring the plant content of elements. - Introducing the student to the most important methods of preparing nutrient solutions.

1. Teaching and Learning Strategies

- Interactive Lecture
- Brainstorming
- Dialogue and discussion
- Field Training
- Practical exercises
- Field Project
- Self-learning

2. Course Structure

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	The week
Semester Exam 1, Final Exam				2 Theoretical	1

	Interactive lecture, brainstorming, dialogue and discussion, self-learning.	Introduction to the importance of plant nutrition, the origin and development of science	A1: The student is aware of information about origin and stages of development of plant nutrition		
,Practical quiz 1	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Laboratory work guidelines, identification Laboratory equipment .	A14: The student gets to know types of laboratory equipment and how it works and how to express the concentration of elements in the plant	3 Practical	
Semester Exam 1, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning.	Essential components of the plant	A2: The student gets to know mineral composition of the plant and the factors affecting it	2 Theoretical	2
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Plant sampling and preparation for chemical analysis	B3: The student gets to know Conditions for taking the sample from field, drying and grinding and preparing it for chemical analysis	3 Practical	
Semester Exam 1, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Plant Growth culture	A3: The student knows the types of nutrient cultures and its importance and advantages and the disadvantages of each type	2 Theoretical	3
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Digestion of plant samples	B4: The student learns how to digest a plant sample, ways of digestion and the advantages of and the disadvantages of each method	3 Practical	
Semester Exam1, Final Exam, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Nutrient absorption	B1: The student gets to know absorbing forms Nutrients and the factors affecting it	2 Theoretical	4
2 Practical quiz	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Preparation acidic extract of plant sample	B5: The student can Preparation of extract acidity of plant samples	3 Practical	
Semester Exam1, Final Exam, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Root, water, absorption and nutrients	B2: The student learns about the structure of the root and how to absorb water and the factors affecting it	2 Theoretical	5
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Estimating the Cationic Exchange capacity of roots	B6: The student knows the methods of estimating Root exchange capacity	3 Practical	
Quiz 1, Final Quiz	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Nutrient absorption theories – theories of negative and active absorption	A4: The student gets to know absorption theories Negative and active	2 Theoretical	6
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Preparation of nutrient solutions	B7: The student can prepare Nutrient solutions of three or four salts	3 Practical	

Semester Exam 2, Final Exam, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Nitrogen in plant	A5: The student gets to know the importance of nitrogen, the way it is absorbed and its transformations within the plant, the symptoms of its deficiency and methods addressed	2 Theoretical	7
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project, self-learning	Determination of Total Nitrogen in Plant Samples	B8: The student can Determine nitrogen- by Kjeldahl method- and how to calculate Concentration in different units	3 Practical	
Semester Exam 2, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	phosphorus in plant	A6: The student gets to know the importance of phosphorus, the way it is absorbed, its transformations within the plant and the symptoms of its deficiency	2 Theoretical	8
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of phosphorus in plant samples	B9: The student can estimate Phosphorus in the chromatic way and how to calculate the concentration in different units	3 Practical	
Semester Exam 2, Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Potassium in plant	A7: The student gets to know the importance of magnesium and the way it is absorbed, the symptoms of its deficiency, methods Processed and the most important Magnesium fertilizers	2 Theoretical	9
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of potassium in plant samples	B10: The student can estimate Potassium using a flame device and how to calculate the concentration In different units	3 Practical	
Semester Exam 2	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Calcium in plant	A8: The student can recognize on the importance of calcium, the way it is absorbed, its transformations within the plant and the symptoms of its deficiency and methods addressed	2 Theoretical	10
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of calcium in plant samples	B11: The student can estimate calcium using chelating substances and how to calculate the concentration In different units	3 Practical	
Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Magnesium in plant	A9: The student can recognize on the importance of magnesium, the way it is absorbed, its transformations within the plant, the symptoms of its deficiency	2 Theoretical	11
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of magnesium in plants	B12: The student can estimate magnesium using recombination with chelating substances	3 Practical	

Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Sulfur in plant	A10: The student gets to know the importance of sulfur, the way it is absorbed, its transformations within the plant and the symptoms of its deficiency	2 Theoretical	12
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of sulfur in plant samples	B13: The student can estimate Sulfur using turbidity method	3 Practical	
Final Exam	Interactive lecture, brainstorming, dialogue and discussion, self-learning	iron and zinc in plant	A11: The student can recognize on the importance of both Iron and zinc, method absorption, transformation within plant and symptoms of deficiency	2 Theoretical	13
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of iron in plant by the chromatography method	B14: The student can estimate iron by the color method	3 Practical	
Quiz 2, Final Quiz, Report	Interactive lecture, brainstorming, dialogue and discussion, self-learning	manganese and copper in plant	A12: The student can recognize on the importance of both manganese, copper, method Absorption and transformation within plant and symptoms of deficiency	2 Theoretical	14
Practical quiz3	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Determination of iron, zinc, manganese and copper in Plant using atomic absorber	B15: The student can estimate micro element cations	3 Practical	
Quiz 3, Final Quiz	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Boron and molybdenum in plant	A13: The student gets to know the importance of boron molybdenum, absorption transformation within the plant, Symptoms of deficiency.	2 Theoretical	15
Home work	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning.	Determination of boron and molybdenum in plants	B16: The student can estimate Boron and molybdenum	3 Practical	

3. Course Evaluation

% Relative Weight	Grade	Calendar date (week)	Evaluation methods	t
2.5	2.5	Fourth week	Report 1	1
2.5	2.5	Fifth week	Report 2	2
2	2	Sixth week	Quiz (1)	3
2	2	Fourteenth week	Quiz (2)	4
1	1	Fifteenth week	Quiz (3)	5
7.5	7.5	Sixth week	Semester Exam (1)	6

7.5	7.5	The first week is difficult	Semester Exam (2)	7
40	40	Final Semester Exams	Final theoretical test	8
5	5	seven Week	Report3	9
2	2	Fourteenth week	Report4	10
1	1	First week	Practical Quiz (1)	11
0.5	0.5	Fourth week	Practical Quiz (2) Quiz	12
1	1	Fourteenth week	Practical Quiz (3) Quiz	13
5.5	5.5	weeks 14,13,12,11,10,9,8,7,6,5,3	and homework	14
20	20	Final Semester Exams	Final Practical Test	15
%100	% 100	100	Total	

4. Learning and Teaching Resources	
Plant Nutrition - Mengele and Kirkby - translated by Dr. Saad Allah Al-Nuaimi	Required textbooks (methodology, if any)
Fertilizers and soil fertility Dr. Saad Allah Al-Nuaimi	Main references (sources)
Soil fertility and fertilization-Dr.Kazem Mashhoot awad Plant physiology. Dr. Abdul azim Kazem	Recommended books and references (scientific journals, reports...)
	Electronic References, Websites

Theoretical subject lecturer:

Assistant Professor Fatih Abid Hassan

Practical subject lecturer:

Lecturer: Reem Walid Al-Saffar

Chairman of the Scientific Committee:

Dr. Abdul Qader Abash sbak



Head of the Department of Soil Science and Water Resources

Dr. Khalid Anwar Khalid

Course Description Form

Course Name:	
Fertilizer technologies	
Course Code: :	
Fertilizer technologies	
Semester / Year: Aumtumn	
second fall semester / 2025–2026	
Description Preparation Date:	
1–2–2025	
Available Attendance Forms: Mandatory	
The presence + online	
Number of Credit Hours (Total) / Number of Units (Total):	
2 Theoretical+ 3 practical	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Rana Saadallah Aziz	
Name :A.T Shaimaa Ghanem Dawaad	
Course Objectives	
Course Objectives Theoretical part: 1. Student education how to take soil models or plant from the field. 2. Detailed knowledge of the most important food and micro nutrients and how to use fertilizers to provide plant to those elements. 3. Identify chemical fertilizer types. 4. Student education means used in the assessment of the forefront and knowledge of the amount of fertilizer and scientific. 5.Kneads and places manufacturing chemical fertilizer. 6.Students towards desire to have better experiences when submitting graduate studies. 7.How to add chemical fertilizers and accounts.	practical part - Detection of types of chemical fertilizers And practical experiments to determine the type of these fertilizers.
Teaching and Learning Strategies	
Theoretical: - Interactive lecture. - Dialogue and discussion. - Assigning tasks and reporting. - Brainstorming . - Special offers on chemical fertilizer manufacturing models.	Practical: - Assigning group work to reveal skills Student leadership. - Assigning tasks and a report for each lecture
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 Practical	Theoretical: shows For the student an introduction to Fertilizer technologies Definitions of types of fertilizers and their purpose them and then classify them Practical: a general idea about each Types of fertilizers, purpose of fertilization, classification of fertilizers.	Theoretical: Introduction to fertilizer technology, objective, Sources, general definitions, general idea For all types of fertilizers, their purpose Fertilization, classification of fertilizers. Practical: Shows the student how to classify fertilizers and the purpose of fertilization	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
2	2 Theoretical 3 Practical	Theoretical: Explains to the student the salt index for fertilizers How to calculate it, with an explanation of the most important points To store fertilizers Practical How to find and calculate the salt index for fertilizers :	Salt Index for fertilizers and how to calculate it, Fertilizer movement, fertilization methods, Points to consider when storing Fertilisers. Practical: It explains to the student what the salt index is, why it is important, what the salt index is, as well as the importance of fertilizers and how to store them.	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
3	2 Theoretical 3 Practical	Theoretical: definition Student through methods Fertilizer manufacturing Phosphate including Phosphoric acid, superphosphate fertilizer	Manufacture of phosphate fertilizers, phosphoric acid, and superphosphate fertilizer Regular, triple superphosphate fertilizer, concentrated superphosphate fertilizer, fertiliser	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical:	Short exams, assigned assignments and discussions.

		Regular, triple, concentrated and fertilizer Ammonium phosphate and urea phosphate. Practical: Phosphate fertilizers, standard specifications for phosphate fertilizers, detection of fertilizers	Ammonium phosphate, urea phosphate. Practical: Introducing the student to how to detect phosphate fertilizers, and knowing the percentage of phosphorus in these fertilizers	Assigning tasks and reporting	
4	2 Theoretical 3 Practical	Theoretical: recognize Student at the fertilizer complex in Al-Qaim And each unit of Complex units Explaining the steps of its production. Practical: Manufacturing different types of nitrogen and phosphate fertilizers	Fertilizer complex in Al-Qaim, with a mention, explanation and detail of each unit of the complex, and production steps for each type Fertilisers. Practical: Introducing the student to methods of manufacturing different types of fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
5	2 Theoretical 3 Practical	Theoretical: recognize The student is more important Nitrogen solutions with slow clarification nitrogen fertilizers Liberation and recognition On the forms of packaging Practical: Nitrogen fertilizers Standard specifications for nitrogen fertilizers and slow-release fertilizers	Nitrogen solutions, slow-release nitrogen fertilizers, slow-release compounds in water, forms of packaging, environmental problems For nitrogen fertilizers. Practical: The student learns about the types of slow-release fertilizers, and the purpose of packaging fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.

6	2 Theoretical 3 Practical	Theoretical: recognize The student is on the road Fertilizer evaluation And methods of mixing them And examples of it. Practical: Fertilizer evaluation Fertilizer mixing guide	Fertilizer evaluation and mixing, descriptive and quantitative evaluation of fertilizers, fertilizer mixing guide, Examples of mixing fertilizers. Practical: The student learns about the foundations of evaluating fertilizers and how to mix fertilizers using mathematical methods	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
7	2 Theoretical 3 Practical	Theoretical: recognize Student on fertilizers, especially those containing... On potassium, its forms, factors affecting readiness, and its sources and types. Practical: Potassium fertilizers, factors affecting the readiness of these fertilizers, calculating the percentage of potassium in these fertilizers.	Fertilizers containing potassium, forms of potassium in the soil, factors affecting the readiness of potassium, its sources, types of potassium fertilizers, potassium chloride, potassium sulphate, potassium nitrate. Practical: The student learns On how to detect potassium fertilizers, and methods of manufacturing these Fertilisers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
8	2 Theoretical 3 Practical	Theoretical: The student becomes familiar with the financial advice and its objectives Its methods and components, while introducing the student to the critical limits of major and minor elements. Practical: Definition of fertilizer recommendation	The Samadhi recommendation is defined as its objectives Its methods, components, plant analysis, Critical limits for macro and micro nutrients. Practical: Introducing the student to the importance of the fertilizer recommendation and its purpose	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.

		Its goals, methods and components			
9	2 Theoretical 3 Practical	heoretical: It explains the most important organic fertilizers, their importance, the differences between them and mineral fertilizers, their sources, and the factors affecting their decomposition, while giving examples of organic fertilizers. Practical: Estimating the percentage of organic carbon in fertilizer, estimation The percentage of total nitrogen in Fertilizer	Organic fertilizers, their importance, division Organic fertilizers, differences between organic and chemical fertilizers, notes that This must be taken into account when choosing fertilizers Organic matter, its sources, types, methods of adding it, factors affecting decomposition Organic fertilizer, examples of calculating the amount of organic fertilizer. Practical: Conduct laboratory experiments to calculate the percentage of organic carbon and the percentage of total nitrogen in organic fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Conducting weekly oral or written tests.
10	2 Theoretical 3 Practical	Theoretical: recognize The student receives fertilizers containing calcium and magnesium Knowing its critical limits and clarifying its problems in Iraqi soil. Practical: The importance of fertilizers containing calcium and magnesium, standard specifications for these fertilizers	Fertilizers containing calcium and magnesium and their critical limits and problems in Iraqi soils Practical: Explains to the student how to detect these fertilizers and methods of manufacturing them	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.

11	2 Theoretical 3 Practical	Theoretical: Explains. Fertilizers for the student Major elements Practical: The importance of micronutrient fertilizers, standard specifications, and determinants of using these fertilizers	Micronutrient fertilizers (iron, zinc, manganese, boron, copper, molybdenum. Practical: Explains to the student how to detect these fertilizers and methods of manufacturing them	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
12	2 Theoretical 3 Practical	Theoretical: The student learns about the element sulfur, its limits, and its problems in Iraqi soil. Practical: sulfur fertilizers, types of sulfur fertilizers, standard specifications	Sulfur and its presence Sulfur as a critical boundary conditioner has its benefits and problems in the soil. Practical: Instructing students on how to find the percentage of sulfur in these fertilizers, conducting laboratory experiments to detect these fertilizers.	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
13	2 Theoretical 3 Practical	Theoretical: Explains to the student the methods of manufacturing fertilizers and their problems Practical: Fertilizer manufacturing methods	Fertilizer industry, raw materials used in manufacturing, its problems Practical: Introducing the student to the materials used in the manufacture of fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
14	2 Theoretical 3 Practical	Theoretical: Explains to the student the types of nitrogen fertilizers and their use as fertilizer. Practical: Standard specifications for nitrogen	Nitrogen fertilizer, anhydrous ammonia, ammonium nitrate, urea, hydrolyzate Urea in the soil and used as fertilizer. Practical: Introducing the student to how to detect nitrogen fertilizers, and	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical:	Short exams, assigned assignments and discussions.

		fertilizers, methods of using these fertilizers	methods of manufacturing these fertilizers	Assigning tasks and reporting	
15	2 Theoretical 3 Practical	Theoretical: The student will become familiar with the most important electronic instructions and problems and the optimal use of brand name techniques. Practical: Methods of dealing with fertilizers, and how to add these fertilizers to the soil	Guidance and associated environmental problems Using fertilizers, optimal use Chemical fertilizer technologies in Iraqi agriculture. Practical: Introducing the student to the most important guidelines used in using fertilizers and how to use them	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.

Course Evaluation

T	Calendar methods	Calendar date (week)	Class	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15.	7 theoretical + 6 practical	13%
2	Short test (1) Quiz	week (3)	4 theoretical + 2 practical	6%
3	Midterm Exam (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	Short test Quiz(2)	week (12)	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%

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fertilizer technologies book.
Main references (sources)	1. Lectures prepared from the Internet. 2. Fertilizer technologies by Dr. Nour El-Din Shawky Ali 2007.

Recommended books and references (scientific journals, reports...)	1. Fertilizers and soil fertility. Written by Dr. Saadallah Najm Abdullah Al-Naimi 1999. College of Agriculture / University of Mosul. 2. Fertilization and soil fertility. Written by Dr. Kazem Mashhout Awad 1987. College of Agriculture / University of Basra.
Electronic References, Websites	FAO


Theoretical subject teacher:
Dr. Rana Saadallah Aziz


practical subject teacher:
A.T. Shaimaa Ghanem Dawaad


Chairman of the Scientific Committee:
Dr. Abdul Qader Abash Sabak




Head of the Department of Soil Sciences:
Dr. Khaled Anwer Khaled

Course Description Form

Course Name:	
Land Reclamation	
Course Code:	
LARE457	
Semester / Year:	
Spring second semester 2025–2026	
Description Preparation Date:	
1 /9/ 2025	
Available Attendance Forms: Mandatory attendance	
Cuonpuncry + Onlin	
Number of Credit Hours (Total) / Number of Units (Total) :	
2 theoretical + 3 practical 3 units	
Course administrator's name (mention all, if more than one name)	
Name: . Ahmed Khair El-Din Abdel Salam Mr Mrs. Noor jamal Hussien	
Course Objectives	
Theoretical 1-Preparing students who have the ability to evaluate and characterize soils affected by salinity according to scientific concepts and foundations. 2-Entering the agricultural sector with distinguished efficiency by participating in reclamation projects for lands affected by salts. 3-Directing students towards a desire to obtain better experiences when applying for postgraduate studies.	practical: 1- Enabling the student how to use the devices in analysis. 2- Enabling the student how to determine saline soil laboratory. 3- Enabling the student to understand the types of mechanical and chemical analysis. 4- Enabling the student how to deal with the results of the analysis and determine Correct results from abnormal ones.
Teaching and Learning Strategies	
Theoretical 1-Knowledge and understanding. 2- Identifying the problem of salinity, the nature of its treatment, and methods of living with it. 3- Identify the ionic structure of salts. 4- Identifying the salt phases of soils affected by salinity. 5- The possibility of preparing a salt map for areas affected by salinity in order to develop scientific programs for their reclamation.	practical: - Adapting to teamwork to reveal skills. - Assignment of tasks and reports for each committee.
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	a5: Explains to the student Reclamation concept Land and its influence On production agricultural on Global level And the local practical	Reclamation concept Lands and their role In agricultural production	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	a9: Shows the student what it is Reclamation programme Lands and what they are Stages of this program	Reclamation programme Saline lands	Assigning tasks And report.	assignments, discussions
2	2 Theoretical	b1: Explains to the student What are soils? Saline and sodic	Land Reclamation Saline and sodic	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	a13: Explains to the student the mechanism Collect information about The site to be created Reclamation project	The investigation, research and study stage	Assigning tasks And report.	assignments, discussions
3	2 Theoretical	b9: Shows to the student Program stages reclamation Saline lands.	Reclamation programme Salt lands	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	b16: It shows the student how to make decisions and design according to the project data	Design stage And make decisions.	Assigning tasks And report.	assignments, discussions

4	2 Theoretical	c4: Shows the student how to take Decisions based on Information that has been done Collect them in the stage The first	The second stage is calculations Designs and decisions	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	a24: Explains to the student how Conducting settlement work.	Settlement	Assigning tasks And report.	assignments, discussions
5	2 Theoretical	b33: Shows the student how to implement Reclamation programme	The third stage - implementation	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	c22: Applying the lesson in the field teaches the student how to identify lines Contourism.	Filling contour lines	Assigning tasks And report.	assignments, discussions
6	2 Theoretical	a6: Explains to the student the mechanism of the cultivation stage	The fourth stage: cultivation	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	c22: Explains to the student the effect of settlement on the physical and chemical properties of the soil.	The effect of settlement on soil properties and productivity	Assigning tasks And report.	assignments, discussions
7			First semester exam		
8	2 Theoretical	b1: Shows the student how to manage Lands that have been completed Reclaim it	Reclaimed land managemen	The salib audio style Write on Chalkboard style Direct dialogu	Short exams,

	3 practical	c45: Shows the student how to determine Soil salinity in the field and laboratory.	Methods of estimating and expressing salinity	Assigning tasks And report.	assignments, discussions
9	2 Theoretical	c37: Show the student how Dealing with lands Gypsum	Land Reclamation Gypsum	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	a24: leaching requirements	Theoretical correlation of salts	Assigning tasks And report.	assignments, discussions
10	2 Theoretical	b33: Show the student how Dealing with lands Limestone	Land Reclamation Limestone	The salib audio style Write on Chalkboard style Direct dialogue	Short exams,
	3 practical	c22: It teaches the student how to calculate Leaching requirements.	Leaching requirements	Assigning tasks And report.	assignments, discussions
11	2 Theoretical	b33: Shows the mechanism reclamation Sandy lands	Land Reclamation Sandy	The salib audio style write on chalkboard style direct dialogu	Short exams, assignments, discussions
	3 practical	c24: Requ irements calculations Leaching	Washing operations	Assigning tasks And report.	assignments, discussions
12	2 Theoretical	a6:Shows the student what indicators are used to determine the bearing crops to salinity the soil .	Indicators used To determine the bearing Crops to salinity	The salib audio style write on chalkboard style direct dialogu	Short exams,

	3 practical	c37: Shows the student what indicators are used to determine whether a process has been completed Washing.	Indicators used To complete the washing operations.	Assigning tasks And report.	assignments, discussions
13	2 Theoretical	b9: Shows the student how to determine Quality.	My theory: Irrigation water quality	The salib audio style write on chalkboard style direct dialogu	Short exams,
	3 practical	a6: Shows the student how soil turns into soda during the washing process.	The soil turns sodic	Assigning tasks And report.	assignments, discussions
14	2 Theoretical	b1: Shows the student how Control salinity the soil .	Theory: Controlling salinity and ways to live with it	My theory: The salib audio style write on chalkboard style direct dialogu	Short exams,
	3 practical	c24: Explain to the student what it is The danger of sodium the soil .	The danger of sodium	Assigning tasks And report.	assignments, discussions
15			Second semester exam		

Course Evaluation

	Evaluation methods	Evaluation date	Grade Relative	weight %
1	Theoretical final report + practical experience reports	Theoretical week 15, practical week 15	7 theoretical + 6 practical	13%
2	Short test (1) Quiz	week (3)	4 theoretical + 2 practical	6%
3	Exam Midterm (theoretical + practical)	week (9)	10 theoretical + 5 practical	15%
4	Short test (2) Quiz	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	A week of practical exams	20	20%

6	Final theoretical test	The week of theoretical exams	40	100%
	the total		100	100%
Learning and Teaching Resources				
Required textbooks (curricular books, if any)			Land reclamation book / Dr. Ahmed Haider Al-Zubaidi 1989	
Main references (sources)			Land environmental chemistry book.	
Recommended books and references (scientific journals, reports...)			Al-Rafidain Agriculture Journal, Soil Science Journal	
Electronic References, Websites				

Mr. Ahmed Khair El-Din Abdel Salam
Theoretical subject lecturer

Mrs. Noor jamal Hussien
Practical subject lecturer

Dr. Abdul Qader Abash Sabak
Chairman of the Scientific Committee

Dr. Khalid Anwar Khalid
Head of the Department of Soil Sciences



Course Description Form – Graduation Research Project 2

1.	Course Name:	
		Graduation Research Project 2
2.	Course Code:	
		REPR403
3.	Semester / Year:	
		Second (Spring) Semester 2025/2026
4.	Date of Preparation of This Description	
		1/2/2026
5.	Available Forms of Attendance:	
		In-person + Online
6.	Number of Study Hours (Total) / Number of Units (Total):	
		3 practical / 1 unit
7.	Name of the Course Administrator (state all names if more than one):	
		Asst. Lect. Reem Waleed Abduljabbar
		Asst. Lect. Ruaa Ghanim Raad
8.	Course Objectives	
		1. Enabling the student to understand and comprehend how to select a title for the graduation research project 2. Enabling the student to learn the most important methods of compiling topics for writing the graduation research project 3. Enabling the student to become familiar with how to select the topic of the graduation research project 4. Enabling the student to acquire the ability to write the graduation research project 5. The student will be able to judge the importance of the graduation research project topic through analysing its components 6. Enabling the student to learn how to collect the sources for writing the graduation research project
9.	Teaching and Learning Strategies	
		Theoretical – Interactive lecture – Brainstorming – Dialogue and discussion

- **Assignment of tasks and reports**
- **Field training**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Topic Name	Learning Method	Evaluation Method
First	3 practical	b1: The student identifies the sources required for selecting the title of his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Second	3 practical	c1: The student discusses the procedure of writing the components of the graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Third	3 practical	b2: The student reviews the supporting features for delivering the presentation of the graduation research project in the best form	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Fourth	3 practical	a1: The student identifies the factors that make his/her delivery of the graduation research project simple, comprehensible, and clear	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Fifth	3 practical	c2: The student gives examples of the most important results obtained in his/her seminar	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Sixth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment

Seventh	3 practical	c3: The student determines the most important scientific points supporting his/her seminar	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Eighth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Ninth	3 practical	a1: The student identifies the factors that make his/her delivery of the graduation research project simple	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Tenth	3 practical	a1: The student identifies the factors that make his/her delivery of the graduation research project comprehensible and clear	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Eleventh	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Twelfth	3 practical	c2: The student states the most important results obtained in the graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Thirteenth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
Fourteenth	3 practical	c3: The student determines the most important scientific points supporting his/her graduation research project	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment

Fifteenth	3 practical	c3: The student determines the most important scientific points supporting his/her seminar	Discussion of the graduation research project	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Student assessment
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11. Course Evaluation

No.	Evaluation Methods	Evaluation Date (Week)	Mark	Relative Weight %
1	Final theoretical report + practical experiment reports	Theoretical: Week 15 Practical: Weeks 1–15	7 theoretical + 6 practical	13%
2	Quiz 1	Week (3)	4 theoretical + 3 practical	6%
3	Midterm Exam (theoretical and practical)	Week (9)	10 theoretical + 5 practical	15%
4	Quiz 2	Week (12)	4 theoretical + 2 practical	6%
5	Final practical exam	Practical examinations week	20	20%
6	Final theoretical exam	Theoretical examinations week	40	40%
	Total		100	100%

12. Learning and Teaching Resources

Required Prescribed Textbooks (curricular, if any)	Lectures, research papers, theses, and dissertations related to the graduation research project
Main References (Sources)	
Recommended Supporting Books and References (scientific journals, reports, etc.)	
Electronic References and Internet Websites	Websites



Asst. Lect. Reem Waleed Abduljabbar

Course Instructor



Asst. Prof. Dr. Abdulqadir Abash Sabak
Head of the Scientific Committee



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



Asst. Lect. Ruaa Ghanim Raad

Course Instructor



Course Description Form

1. Course Name:
English Language 4
2. Course Code:
ENGL 400
3. Semester / Year:
2025/2026
4. Description Preparation Date:
01/02/2026
5. Available Attendance Forms:
Presence + Online live meeting and Google Classroom
6. Number of Credit Hours (Total) / Number of Units (Total):
30 Hours / 2 Units
7. Course administrator's name (mention all, if more than one name):
Name: Omar AbdulHameed Al-Kurjia Email: omarkj@uomosul.edu.iq

8. Course Objectives
- To continue studying the English language, with a focus on specialized and scientific language - Widening the student's mind about scientific and literary English vocabulary - Helping the students to think and write in English

9. Teaching and Learning Strategies	
Strategy	Making use of the available electronic methods, whether auditory or visual, in addition to the whiteboard, plus Google Classroom

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2 hours Presence	(A) The student should be able to know the basics of the English language	Practicing English with "No Place like Home" + Reading out clearly and	Electronic lectures, videos, posters and other	Exams – Reports – Discussions – Quiz

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
			learning pronunciation + Vocabulary	methods related to learning	
2	2 hours Presence	(A) The student should be able to know the tenses of the English language	Expat Tales: Ian Walker in Chile: Spoken English, informal reading out, listening, speaking, everyday English	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
3	2 hours Presence	(A) The student should be able to know the rules of the English language	Expat Tales 2: Thomas Creed in Korea: Language + conversation with students	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
4	2 hours Presence	(A) The student should be able to know the basics of the English language	Practicing English with “The Blind Assassin” + Reading out clearly and learning pronunciation + Vocabulary	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
5	2 hours Presence	(A) The student should be able to know the basics of the English language	“Starting with Sheep”: Dealing with English in agriculture within different specialties (reading and pronunciation)	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
6	2 hours Presence	(A) The student should be able to know the basics of the English language	Language Focus Part 1 – English in Agriculture 2: Homemade butter	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
7	2 hours Presence	(A) The student should be able to know the basics of the English language	Conspiracy Theory 1: The Death of Diana – Reading out, listening, speaking	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
8	2 hours Presence	(A) The student should be able to know the basics of the English language	Two Famous Brands: Starbucks Coffee – Reading out, listening,	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
			speaking, everyday English		
9	2 hours Presence	(A) The student should be able to know the basics of the English language	Conspiracy Theory 2: The Apollo Moon Landings – Reading out, listening, speaking	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
10	2 hours Presence	(A) The student should be able to know the basics of the English language	Conspiracy Theory 3: The Death of JFK – Reading out, listening, speaking, everyday English	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
11	2 hours Presence	(A) The student should be able to know the basics of the English language	Apple Macintosh – Progressive interaction with students + feedback	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
12	2 hours Presence	(A) The student should be able to know the basics of the English language	“The Kippers” – Read, digest and analyze	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
13	2 hours Presence	(A) The student should be able to know the basics of the English language	The Coldest & Earliest Places on Earth – Reading out, translation to Arabic, learning pronunciation	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
14	2 hours Presence	(A) The student should be able to know the basics of the English language	F.R.I.E.N.D.S (Past) – Reading out, translation to Arabic, learning pronunciation	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz
15	2 hours Presence	(A) The student should be able to know the basics of the English language	Jamie Oliver (The World’s Greatest Chef) – Interaction with students + feedback	Electronic lectures, videos, posters and other methods related to learning	Exams – Reports – Discussions – Quiz

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

No.	Evaluation Methods	Evaluation Date (Week)	Marks	Relative Weight (%)
1	Quiz (1)	Week 4	Theoretical (5)	5
2	Monthly Exam (1)	Week 6	Theoretical (15)	15
3	Quiz (2)	Week 8	Theoretical (5)	5
4	Monthly Exam (2)	Week 13	Theoretical (15)	15
5	Quest rate	Seasonal rates are announced at the end of the semester	Theoretical (40)	40
6	Final Theoretical Test	The week of theoretical exams	60	60
Total			100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	New Headway – English Course, Upper Intermediate, 2020
Recommended books and references (scientific journals, reports, ...)	New Headway – English Course, Upper Intermediate, 2020
Electronic references, websites	• British Council – Upper-Intermediate (B2) https://learnenglish.britishcouncil.org/general-english/upper-intermediate-b2 (Grammar, vocabulary, listening, and reading exercises) • Perfect English Grammar https://www.perfect-english-grammar.com (Detailed grammar explanations and exercises)


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 Course Instructor


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 Head of Department


Dr. AbdulKader Abash Sbik
 Chairperson of the Scientific Committee

