Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Al Furat Al-Awsat Technical University
Faculty/Institute: Al–Mussaib Technical Institute
Scientific Department: Soil & water Department
Academic or Professional Program Name: Technical diploma
Final Certificate Name: Technical diploma in soil &water
Academic System: courses
Description Preparation Date: 2024/4/7
File Completion Date: 2024/4/7

Signature:
Head of Department Name:
Dr. Mohsen Abdullah Karim
Date:2024/4/7

Signature:
Scientific Associate Name:
Dr. Mohammad Hade sabri
Date:2024/4/7

The file is checked by: Aws Mahmoud Karit

Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date: 2024/4/7
Signature:

Approval of the Dean

4

1. Program Vision

This academic program description provides a requisite summary of the most important characteristics of the program and the learning outcomes expected of the student to achieve, proving whether he has made maximum use of the available opportunities. It is accompanied by a description of each course within the program

2. Program Mission

The academic program aims to prepare technical staff capable of dealing with soil in terms of determining its physical and chemical properties, plant nutrition, land reclamation, classification and determining its prospects, as well as dealing with fertilizers, methods of adding them, and managing water resources.

3. Program Objectives

A. Knowledge and Understanding:

A- Cognitive goals

A1- Autumn semester:

(Soil principles, planar and topographical surveying, agricultural drawers, engineering drawing, soil microbiology, plant production, computer applications/1, human rights)

Spring semester:

(Soil chemistry, soil pollution, water resources, agricultural economics, desertification, soil preparation equipment, plant nutrition, computer applications/1, democracy, English language)

A2- Autumn semester:

(soil physics, land modification and leveling, drainage, soil salinity, soil analysis, reclamation machinery and equipment,

Organic Agriculture, Computer Applications/2, Research Project)

Spring semester:

(Survey and classification of soil, soil maintenance and irrigation projects, irrigation water quality, soil fertility and fertilization, soil reclamation and management, remote sensing, computer applications/2, research project)

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Lecture , solving examples, workshop, laboratory, graduation project, summer training

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				
Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year /Level	Course Code	Course Name	Credit Hours	
1st year			Theoretica	practical
		Microscopic Soil Revival	1	3
		Survey plan and topographic	2	3
		Soil Principal	2	3
		Agricultural pullers	1	3
		Engineering Drawing	-	3
		Plant production	1	-
		English Language	0	1
		Human Right	0	2
		Computer Application	2	2
		Soil Physics		

2nd year					**3**
					2
					2
					2
					2
					2

8. **Expected learning outcomes of the program**	
Knowledge	
Providing academic support capabilities in organizing field visits	Providing an appropriate classroom environment that enables the teacher to diversify teaching strategies.
Skills	
information technology in the campus library.	Hosting experts from outside the institute, or from the work environment for which they are preparing to benefit from their expertise in developing the course according to the actual needs of the labor market.
Ethics	
Written tests semester exams	Oral and scientific tests
Student projects and daily reports	Final exams and daily evaluation

9. **Teaching and Learning Strategies**
Be within the central acceptance planning approved by the Ministry of Higher Education and Scientific Research.

10. **Evaluation methods**

1- Daily exams

2-Ask some questions

3-Giving homework

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline														
				Required program Learning outcomes										
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics		
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
		Microscopic Soil Revival	Core	√	√	√	√	√	√	√	√	√	√	√	√
		Survey plan and topographic	Core	√	√	√	√		√	√	√	√		√	√
		Soil Principal	Core	√	√	√	√		√				√		
		Agricultural pullers	Core	√	√	√	√	√	√	√	√	√	√	√	
		Engineering Drawing	Core	√	√	√	√	√		√	√	√	√	√	√
		Plant production	Core	√	√	√	√	√		√	√	√	√	√	√
		English Language	Core	√	√	√	√	√	√	√	√		√		√
		Human Right		√	√	√	√	√	√	√	√	√	√		√

	Soil Physics	**Core**	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√
	Land modification and settlement	**Core**	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
	Soil Analysis	**Core**	√		√		√	√	√	√	√	√	√	√	√	√	√	√
	Soil Salinity	**Core**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Drainage	**Core**	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√
	Machines and Equipment	**Core**	√		√	√	√	√	√	√		√	√	√	√	√	√	√
	Project	**Core**	√	√	√		√				√	√	√	√	√			√
	English language	**Core**	√	√		√	√	√	√	√	√	√	√	√	√		√	√

Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Course Description Form

1. Course Name:
Survey
2. Course Code:
1
3. Semester / Year:
Semester - first level
4. Description Preparation Date:
2024/4/7
5. Available Attendance Forms:
direct – mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours/4 Units
7. Course administrator's name (mention all, if more than one name)
Name: Sabah Mahdi Jassim Email:
8. Course Objectives

Course Objectives	**Teaching the student to know t concept of reclamation, soil and wa testing, and the reclamation different types of saline and san soils, among others**
9. Teaching and Learning Strategies	
Strategy	**Understand the concept of reclamation** **Learn about soil salinity measurements** **.Learn about soil and water tests and determine their validity** **.Identify the sources of salinity** **.Identify the soils affected by salinity** **.Learn how to reclaim gypsum - calcareous - dry - soda soils** **Recognizing how to calculate water needs in dry areas and t optima use of soil and water**
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
					Evaluation method
					questions and answers
					Ask questions
					Listening ask questions
					case study
					case studies
					mini lesson discussion
					case study
					Listening ask questions
					Listening ask questions
					case study
					Listening ask questions
					case studies
					mini lesson discussion
					Listening ask questions
					case studies
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
12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Soil reclamation and management
2. Course Code:
1
3. Semester / Year:

Semester - first level	
4. Description Preparation Date:	
2024/4/7	
5. Available Attendance Forms:	
direct – mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/4 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Sabah Mahdi Jassim Email:	
8. Course Objectives	
Course Objectives	**1- Familiarize yourself with the different survey devices 2- Learn how to measure the horizontal distances of flat and sloping 3- Learn how to erect and drop columns Learn how to wipe with a 4.tape measure Learn how to conduct a survey and how to read the 5.leveling device 6Learn how to calculate the levels of points using the method (the scale surface - (height and depression 7.Learn how to perform double a inverted settlement**
9. Teaching and Learning Strategies	
Strategy	

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
Week	**3**	Getting to know the concept of reclamation - its importance and methods	the concept of reclamation - its importance and methods	Lecture and discussion	questions and answers
1	**3**	**Learn about soil and water tests**	**soil and water tests**	Lecture and discussion	ask questions
2	**3**	**Learn about the reclamation of saline soils**	**the reclamation of saline soils**	Lecture and discussion	Listen and ask questions
3	**3**	**Identify sources of salinity and salt relationships - and calculate washing requirements**	**sources of salinity and salt relationships - and calculate washing requirements**	Dialogue and criticism	case studie
4	**3**	**Understand the effect of soil salinity on plants**	**the effect of soil salinity on plants**	Lecture and discussion	case studies
5	**3**	**Understand the effect of soil salinity on plants**	**the effect of soil salinity on plants**	Discussion and mini lesson	mini lesson discussion
6	**3**	**Learn about the reclamation of gypsum soils**	**the reclamation of gypsum soils**	Lecture and discussion	case studie
7	**3**	**Learn about the reclamation of limestone soils**	**the reclamation of limestone soils**	Lecture and discussion	Listen and ask questions
8	**3**	**Learn about the reclamation of limestone soils**	**the reclamation of limestone soils**	Discussion and mini lesson	Listen and ask questions
9	**3**	**Learn about the reclamation of limestone soils**	**the reclamation of limestone soils**	Lecture and discussion	Listen and ask questions
10	**3**	**Identifying water needs in dry areas** Optimum use of soil and water	**water needs in dry areas** Optimum use of soil and water	lecture and criticism	Listen and ask questions
11	**3**	**Learn about the reclamation of soddy soils**	**about the reclamation of soddy soils**	Lecture and discussion	questions and

					answers
12	**3**	**Learn about reclaiming sandy soils**	**reclaiming sandy soils**	Lecture and discussion	ask questions
13	**3**	**Learn about the reclamation of wetland soils**	**the reclamation of wetland soils**	Lecture and discussion	Listening ask questions
14	**3**	**Learn about the reclamation of acidic soils**	**the reclamation of acidic soils**	Lecture and discussion	Listening ask questions
15	**3**	**Learn about the management and exploitation of reclaimed soils**	**the management and exploitation of reclaimed soils**	Dialogue and criticism	Listening ask questions

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

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

Course Description Form

13. Course Name:
General Soil Principles
14. Course Code:
1
15. Semester / Year:
Semester - first level
16. Description Preparation Date:
2024/4/7
17.Available Attendance Forms:
direct – mandatory
18.Number of Credit Hours (Total) / Number of Units (Total)

60 hours/4 Units

19. Course administrator's name (mention all, if more than one name)

Name: Anesar abd Alkalk
Email:

20. Course Objectives

Course Objectives	**Teaching the student the basics soil science - its branches - importance and applications. learns about the physical, chemi and morphological characteristics the soil**

21. Teaching and Learning Strategies

Strategy	**.Scientific lecture** **.Discussion between students .** **. Make reports about the lecture**

22. Course Structure

the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
the first	3	Understand the concept of soil science and its applied importance	Soil science definition and branches – its practical importance	Continuous orientation of students by the professor during the lecture	questions and answers
The second	3	Identify the rocks that make up the parent material	The rocks that make up the parent material	Lecture and discussion	ask questions
the third	3	Identify the features that	Features of the parent substance	Lecture and discussion	Listening ask

		make up the parent material			questions
the fourth	3	Learn about soil formation factors	soil formation factors	Lecture and discussion	case studie
Fifth	3	Learn about soil formation processes	soil formation processes	Dialogue and criticism	case studies
VI	3	Recognize the differentiation of layers and the composition of the soil and its development.	the differentiation of layers and the composition of the soil and its development.	Lecture and discussion	mini lesson discussion
seventh	3	Understand the physical and mechanical properties of the soil	the physical and mechanical properties of the soil	Discussion and mini lesson	case studies
VIII	3	Knowing the texture of the soil	the texture of the soil	Lecture and discussion	Listen and ask questions
ninth	3	Knowing the salinity of the soil	the salinity of the soil	Lecture and discussion	Listen and ask questions
The tenth	3	Understanding Soil Fertility – Soil Fertilization	Soil Fertility – Soil Fertilization	Present and criticism	case studies
eleventh	3	Identify the organic matter in the soil	the organic matter in the soil	Lecture and discussion	questions and answers
twelveth	3	Understanding soil water – soil temperature	soil water – soil temperature	Lecture and discussion	ask questions
Thirteenth	3	Knowing the soil air	the soil air	Lecture and discussion	Listen and ask

					questions
Fourteenth	**3**	**Learn about the morphological signs of soil**	**the morphological signs of soil**	**Lecture and discussion**	**Listen and ask questions**
Fifteenth	**3**	**Get to know the general classification of soil**	**the general classification of soil**	**Lecture and discussion**	**Listening ask questions**

23. Course Evaluation

Providing academic support capabilities in organizing field visits

Providing the appropriate classroom environment that enables the teacher to .diversify teaching strategies

.Providing information technology in the campus library

Hosting experts from outside the institute, or from the work environment for which they are preparing to benefit from their expertise in developing the course according to the actual needs of the labor market

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Abdul-Fattah Al-Ani, Basics Soil Science, University Baghdad, 1984.**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

25. Course Name:
plant nutrition
26. Course Code:
1
27. Semester / Year:
Semester - first level
28. Description Preparation Date:
2024/4/7
29.Available Attendance Forms:
direct – mandatory
30.Number of Credit Hours (Total) / Number of Units (Total)
60 hours/4 Units
31. Course administrator's name (mention all, if more than one name)
Name: Anesar abd Alha Email:
32. Course Objectives

Course Objectives	**Teaching the student the plan need for nutrients and filling t deficiency through fertilizatio determining the quantity and qual of fertilizer used, and diagnosing t symptoms of deficiency**
33. Teaching and Learning Strategies	
Strategy	**.Scientific lecture** **.Discussion between students .** **.Make reports about the lecture**

34. Course Structure					
the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
the first	3	Identify, define, and classify nutrients	Nutrients, definition, division	Continuous orientation of students by the professor during the lecture	questions and answers
The second	3	١To learn about the inorganic chemical composition of the plant and the factors affecting it	The inorganic chemical composition of the plant and the factors affecting it	Lecture and discussion	ask questions
the third	3	Recognizing the relationship of plants with different growth media, factors affecting the availability of nutrients	Plant relationship with different growth media, factors affecting the availability of nutrients	Lecture and discussion	Listening ask questions
the fourth	3	Understand the absorption and transport of nutrients, free transport, biological transport, negative absorption theories	Nutrient absorption and transport, free transport, biological transport, negative absorption theories	Lecture and discussion	case studies

Fifth	3	Understand the absorption and transport of nutrients, free transport, biological transport, negative absorption theories	Nutrient absorption and transport, free transport, biological transport, negative absorption theories	Dialogue and criticism	case studies
VI	3	Learn about nutrient solutions, types of artificial farms, advantages, disadvantages	Nutrient solutions, types of artificial farms, advantages, disadvantages	Lecture and discussion	mini lesson discussion
Seventh	3	Learn about plant nutrition, water stress and its physiological effects	Water and plant nutrition, water stress and its physiological effects	Discussion and mini lesson	case studie
VIII	3	Identify the applied aspects of water stress, water stress and irrigation	Applied aspects of water stress, water stress and irrigation	Lecture and discussion	Listen and ask questions
Ninth	3	Identifying the degree of interaction of the medium and plant growth, comparing soil and farm	The degree of interaction of the medium and plant growth, a comparison between soil solutions and farm solutions	Lecture and discussion	Listen and ask questions

		solutions			
The tenth	**3**	**Learn about nutrients in nature, the cycles of nitrogen, phosphorous, sulfur in nature**	**Nutrients in nature, cycles of nitrogen, phosphorous, sulfur in nature**	**lecture and criticism**	**case studie**
Eleventh	**3**	**Identifying mineral nutrition and yield quality, how to fertilize plants, nutrition and yield response, and the relationship between them**	Mineral nutrition and yield quality, how to fertilize plants, nutrition and yield response, the relationship between them	Lecture and discussion	ask questions
Twelveth	**3**	**Salinity recognition and plant nutrition**	**recognition and plant nutrition**	Lecture and discussion	ask questions
Thirteenth	**3**	**Learn about stability and plant nutrition**	Persistence and plant nutrition	Lecture and discussion	Listening
fourteenth	**3**	**Learn about nutrition and plant diseases**	Nutrition and plant diseases	Lecture and discussion	Listening ask questions
Fifteenth	**3**	**Identify the absorption and transfer of nutrients, symptoms of element deficiency**	Absorption and transport of nutrients, symptoms of element deficiency	Dialogue and criticism	Listening ask questions

35. Course Evaluation

Providing academic support capabilities in organizing field visits

Providing the appropriate classroom environment that enables the teacher to .diversify teaching strategies

.Providing information technology in the campus library

Hosting experts from outside the institute, or from the work environment for

which they are preparing to benefit from their expertise in developing the course according to the actual needs of the labor market	
36. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Plant Nutrition Book**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Soil Microbiology	
2. Course Code:	
1	
3. Semester / Year:	
Semester - first level	
4. Description Preparation Date:	
2024/4/7	
5. Available Attendance Forms:	
direct – mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/4 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohsen Abdullah Karim Email:	
8. Course Objectives	
Course Objectives	**The student should be able to kn the role of soil microbiology**

	improving soil fertility and pla growth in it, as well as identifyi the importance of soil biology a being able to isolate it, methods diagnosis and reproduction, and role in nitrogen fixation and transformations, the decompositi of organic matter, phosphoro transformations, and the readin of nutrients.

9. Teaching and Learning Strategies

Strategy	**1.Scientific lecture** **2.Discussion between students** **3. Make reports about the lecture**

10. Course Structure

the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
1	4	Learn about the history of soil microbiology and its relationship with other sciences	Soil microbiology, its definition, its place among the rest of the microbiological sciences and its importance	Continuous orientation of students by the professor during the lecture	questions and answers
2	4	Knowing how to classify soil organisms into micro and macro organism	Classification of Soil Biology, Micro Organisms, and Macro Organisms	Lecture and discussion	Ask questions

3	4	Identify the groups of soil microorganisms	Divide soil microorganisms into their main groups	Lecture and discussion	Listening ask questions
4	4	To identify the groups of organisms, their types and genera, and the role of each of them in the development and increase of agricultural production	Important soil biota aggregates and their relationship to agricultural production	Lecture and discussion	case study
5	4	Identifying the mechanism of the emergence and formation of soil agglomerations from microorganisms	The role of microorganisms in the formation and formation of soil	Dialogue and criticism	case studies
6	4	Recognize the physical properties of soil such as soil texture, aggregates, and moisture. Chemical soil moisture such as salinity, acidity and important	Effect of soil physical and chemical properties on growth and activity of microorganisms	Lecture and discussion	mini lesson discussion

		nutrients			
7	4	Identify the role of agricultural operations to reduce or increase their numbers in the soil	The effect of agricultural operations on the microbiology of the soil	Discussion and mini lesson	case study
8	4	Identifying the revival of the root zone, how to install important nutrients to increase agricultural productio	Biology of the root zone (rhizosphere) and its importance in agricultural production	Lecture and discussion	Listening ask questions
9	4	Understand the role of carbon in the decomposition of organic matter in the soil	The role of carbon in the processes of decomposition of organic matter, the carbon cycle	Lecture and discussion	Listening ask questions
10	4	Identify the most important theories that work on the decomposition of organic matter and the formation of humus	Humus formation theories, the effect of soil processes on the decomposition processes of organic matter	Discussion and mini lesson	case study

11	4	Identifying the ratios of nitrogen to carbon and the role of microorganisms in this	C/N ratio, decomposition rate of organic matter and biology activities	Lecture and discussion	Listening ask questions
12	4	Recognize the importance of the pony cycle in nitrogen fixation	The nitrogen cycle, the processes of the transformation of atmospheric nitrogen, the microbiology of the transformation process	Dialogue and criticism	case studies
13	4	Identify the most important soil organisms involved in the processes of nitrogen transformation in the soil	Nitrification process, nitrification process, reduction and reverse nitrification, bio-nitrogen fixation, symbiosis and non-symbiosis	Lecture and discussion	mini lesson discussion
14	4	Identify the most important soil organisms in sulfur	The role of soil microorganisms in sulfur transformations	Dialogue and criticism	Listening ask questions

		transformations			
15	**4**	**To identify the role of soil microorganisms in the transformations of phosphorous and iron elements**	**The role of soil microbiology in the vital transformations of phosphorous and iron**	**Discussion and mini lesson**	**case studies**

11. Course Evaluation

Providing academic support capabilities in organizing field visits

Providing the appropriate classroom environment that enables the teacher to diversify * .teaching strategies

.Providing information technology in the campus library *

*** Hosting experts from outside the institute, or from the work environment for which they are preparing to benefit from their expertise in developing the course according to the actual needs of the labor market**

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**1.Soil microbiology. Written by Dr. Radi Kazem Al-Rashidi.** **2. Microbiology. Written by Dr. Hala Daghestani**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Soil chemistry
2. Course Code:
1
3. Semester / Year:
Semester - first level
4. Description Preparation Date:
2024/4/7
5. Available Attendance Forms:
direct – mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours/4 Units
7. Course administrator's name (mention all, if more than one name)
Name: Aws Mahmoud Karit Email:
8. Course Objectives

Course Objectives	**Knowing the chemical propert of soil through the use of differe chemical concepts by conducti chemical analyzes to estimate t positive and negative ions in the s and to estimate the organic mat and clay minerals.**
9. Teaching and Learning Strategies	
Strategy	**1.Scientific lecture** **2.Discussion between students** **3. Make reports about the lecture**
10. Course Structure	

the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
1	5	Properties of dilute solutions, ionization and dissociation, hydrolysis, chemical equilibrium, solubility product	Reaction rate, chemical equilibrium, equilibrium constant, law of mass action, ionization	Continuous orientation of students by the professor during the lecture	questions and answers
2	5	Soil chemistry, its importance and its relationship to other sciences – the chemical composition of soil – its constituent minerals	Definition of acids and bases, dissociation, hydrolysis, solubility, solubility yield, solution, the importance of studying soil chemistry and its role in agricultural production	Lecture and discussion	Ask questions
3	5	Primary soil minerals, oxides, carbonates, sulfates and chlorides, silicates, phosphates	Primary soil minerals and their types, oxides and hydroxides Carbonate minerals, sulfate minerals, silicate minerals	Lecture and discussion	Listening ask questions
4	5	Secondary soil minerals, clay minerals, the effect of soil mineral	Secondary soil minerals and their types, a comparison between primary	Lecture and discussion	case study

		composition on its chemical and physical properties	and secondary soil minerals, the effect of multiple silicate minerals		
5	5	organic matter chemistry	Definition, proportions, decomposition, chemical properties, components, importance	Dialogue and criticism	case studies
6	5	Soil Colloidal System	Definition of soil colloids, construction of colloids, their types (organic, mineral), composition of colloids, their chemical properties, sources of charge in them.	Lecture and discussion	mini lesson discussion
7	5	CEC Soil, the role of cations in plant nutrition, its role in holding ions	Definition of CEC, Determination of Cation Exchange Capacity, Determination of Mutual Cations	Discussion and mini lesson	case study
8	5	The phenomenon of ion exchange	Defining the phenomenon of	Lecture and discussion	Listening ask

			ion exchange, the importance of ion exchange for soil and plants		questions
9	5	The degree of reaction of the soil PH, the sources of acidity in the soil	Estimation of the degree of soil reaction, measurement of soil resistance to change in the degree of reaction	Lecture and discussion	Listening ask questions
10	5	The relationship between soil chemical properties and the readiness of nutrients	The relationship between soil chemical properties and the readiness of nutrients .	Discussion and mini lesson	case study
11	5	Soil solution, its ions, its components	The composition and properties of the soil solution, the nature of the chemical equilibrium of the soil solution, the calculation of the ionic strength, the effectiveness and concentration of ions in the solution, the ionic activity and how to know it	Lecture and discussion	Listening ask questions
12	5	The effect of soil chemical properties on soil	The effect of soil chemical properties on soil	Dialogue and criticism	case studies

		fertility	**fertility**		
13	**5**	**chelated compounds**	**Definition of chelated compounds, how to prepare chelated compounds**	**Lecture and discussion**	**mini lesson discussion**
14	**5**	**Methods for diagnosing clay minerals using X-rays**	**Determination of clay minerals using refracted X-rays, diagnosis of clay minerals using thermal analysis and electron microscopy**	**Dialogue and criticism**	**Listening ask questions**
15	**5**	**Radioactive isotopes and their applications in soil**	**Radioactive isotopes and their applications in soil**	**Discussion and mini lesson**	**case studies**

11. Course Evaluation

Providing academic support capabilities in organizing field visits

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12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Soil chemistry**
Main references (sources)	
Recommended books and references (scientific	

journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Drainage	
2. Course Code:	
1	
3. Semester / Year:	
Semester - first level	
4. Description Preparation Date:	
2024/4/7	
5. Available Attendance Forms:	
direct – mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/4 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Aws Mahmoud Karit Email:	
8. Course Objectives	
Course Objectives	**To know what is related drainage, its importance and effects on soil and plants, and how prepare investigations (s investigations and hydrologi investigations) and calculate t dimensions of drainages because their impact on salinization of land**
9. Teaching and Learning Strategies	
Strategy	**1.Scientific lecture** **2.Discussion between students**

	3. Make reports about the lecture

10. Course Structure

the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
1	4	Puncture definition, puncture objectives	Definition of puncture, basic justifications for puncture process, sources of puncture water (surface, subsurface)	Continuous orientation of students by the professor during the lecture	questions and answers
2	4	Impact of puncture on soil and plants	How does puncture affect soil and plants	Lecture and discussion	Ask questions
3	4	Movement of water in saturated soil	Measurement of soil permeability by laboratory and field methods	Lecture and discussion	Listening ask questions
4	4	Investigations and surveys of puncture projects	soil investigations	Lecture and discussion	case study
5	4	Investigations and surveys of puncture projects	Hydrological investigations	Dialogue and criticism	case studies
6	4	Types of troughs and drainage	Horizontal puncture	Lecture and discussion	mini lesson discussion

		nets	networks and vertical puncture networks (pumping wells), how to design and implement puncture networks		
7	4	open field drainages	Classifications, characteristics and disadvantages, how to design and implement open field troughs	Discussion and mini lesson	case study
8	4	Covered field trocars	Its divisions, advantages and disadvantages, how to design and implement covered field drains	Lecture and discussion	Listening ask questions
9	4	The depths and spacing of the grooves	Calculation of the dimensions and depths of the troughs	Lecture and discussion	Listening ask questions
10	4	Determination of puncture coefficient, inclination, diameter	Determination of puncture coefficient, inclination, diameter	Discussion and mini lesson	case study

11	4	Covered troughs materials and installations	Covered troughs materials and installations	Lecture and discussion	Listening ask questions
12	4	Water and salt balance in the root zone and the role of puncture in its regulation	Water and salt balance in the root zone and the role of puncture in its regulation	Dialogue and criticism	case studies
13	4	Puncture mechanization	Machines and machines used in puncture operations, calculating puncture efficiency	Lecture and discussion	mini lesson discussion
14	4	Maintenance and maintenance of drainage networks	Maintenance of open and covered troughs	Dialogue and criticism	Listening ask questions
15	4	Puncture problems in Iraq	Puncture problems in Iraq, a practical visit to one of the puncture projects	Discussion and mini lesson	case studies

11. Course Evaluation

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12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**syllabus**

Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Soil salinity
2. Course Code:
1
3. Semester / Year:
Semester - first level
4. Description Preparation Date:
2024/4/7
5. Available Attendance Forms:
direct – mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours/4 Units
7. Course administrator's name (mention all, if more than one name)
Name: Aws Mahmoud Karit Email:
8. Course Objectives

Course Objectives	**Identifying salinity in soil, its sources and components, its effects on soil and plants, types of salinization, the role of ground water in the salinization process, and classification of salt-affected soils.**
9. Teaching and Learning Strategies	
Strategy	**1.Scientific lecture** **2.Discussion between students** **3. Make reports about the lecture**

10. Course Structure					
the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
1	4	Soil salinity definition and importance	Definition of soil salinity, the importance of salinity in agriculture, how to make a salinity map for a land affected by salts.	Continuous orientation of students by the professor during the lecture	questions and answers
2	4	Sources of salt in the soil	Sources of salts in the soil in general and in Iraqi soil in particular, and the means and mechanisms for transferring salts to the soil	Lecture and discussion	Ask questions
3	4	Primary salinity and secondary salinization	Primary salinity and secondary salinization	Lecture and discussion	Listening ask questions
4	4	Determination of the critical depth of ground water	Determination of the critical depth of ground water, critical salinity of ground water, salinization phases in Iraqi soils.	Lecture and discussion	case study
5	4	The effect of temperature on	The effect of temperature on	Dialogue and	case studies

		the melting of salts	the melting of salts, the stages of formation of soils affected by salts	criticism	
6	4	Sodic soils	Soddy soils, their properties, and their effect on soil and plants	Lecture and discussion	mini lesson discussion
7	4	Salt balance in soils and the effect of salts on soil properties	Salt and water balance (in high areas, in lands with shallow groundwater)	Discussion and mini lesson	case study
8	4	Classification of soils affected by salts according to the American classification	Classification of soils affected by salts according to the American classification	Lecture and discussion	Listening ask questions
9	4	Classification of salt-affected soils according to the Russian classification	Russian classification of salinity-affected soils, the effect of increased salt in the soil on plants growing in them	Lecture and discussion	Listening ask questions
10	4	The effect of salinity on the organisms in the soil	The effect of salt on the activity of microorganisms in the soil	Discussion and mini lesson	case study
11	4	Irrigation water validity	Factors determining the suitability of	Lecture and discussion	Listening ask questions

			irrigation water, the most important classifications for determining the suitability of irrigation water		
12	4	Using saline water for irrigation	Using saline water for irrigation	Dialogue and criticism	case studies
13	4	Living with salinity	Ways to live with salinity	Lecture and discussion	mini lesson discussion
14	4	The effect of increased salt on the plants growing there	Classification of plants in terms of the nature of their impact on salinity, manifestations of the effect of salinity on agricultural crops	Dialogue and criticism	Listening ask questions
15	4	Cultivation of salinity affected soils	Salinity tolerance of crops, indicators used to determine salinity tolerance of crops	Discussion and mini lesson	case studies

11. Course Evaluation

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12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**syllabus**
Main references (sources)	**Soil salinity book d. Ahmed al-Zubaidi**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Desertification
2. Course Code:
1
3. Semester / Year:
Semester - first level
4. Description Preparation Date:
2024/4/7
5. Available Attendance Forms:
direct – mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
45 hours/3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Diyaa Hussein abs Email:
8. Course Objectives

Course Objectives	**Learn about the concept desertification, its cases, typ causes, means of its spread and effects on Iraq, the Arab world a the world, and the local a**

	international means to combat it a limit its damage to the environme and society.

9. Teaching and Learning Strategies

Strategy	**1.Scientific lecture** **2.Discussion between students** **3. Make reports about the lecture**

10. Course Structure

the week	hours	Required learning outcomes	The name of the unit or topic	education method	Evaluation method
1	3	Definition of desertification	Definition of desertification, extent of desertification, cases of desertification, causes of desertification, effects of desertification.	Continuous orientation of students by the professor during the lecture	questions and answers
2	3	The basic principles of combating desertification	The basic principles of combating desertification, the information room necessary to determine the methods of	Lecture and discussion	Ask questions

			control		
3	3	Natural resources in the Arab world	Agricultural lands, natural pastures, forests, water	Lecture and discussion	Listening ask questions
4	3	riches	Plant wealth, livestock, biodiversity, human resources	Lecture and discussion	case study
5	3	The deterioration of Arab natural resources	The deterioration of Arab natural resources , Arab economic situation	Dialogue and criticism	case studies
6	3	Combat Desertification	The measures taken in the Arab world to combat desertification and its obstacles, the mechanisms used to combat desertification and the parties involved in it	Lecture and discussion	mini lesson discussion
7	3	United Nations convention to combat desertification	The United Nations Convention to Combat Desertification and its Implementation Phases in the Arab World	Discussion and mini lesson	case study

8	3	Methodologies for tracking, evaluating and setting indicators in the field of desertification	Methodologies for tracking, evaluating and setting indicators in the field of desertification	Lecture and discussion	Listening ask questions
9	3	Some global experiences in monitoring and combating desertification	Some global experiences in monitoring and combating desertification	Lecture and discussion	Listening ask questions
10	3	Curricula and indicators used to monitor and combat desertification in the Arab world	Curricula and indicators used to monitor and combat desertification in the Arab world	Discussion and mini lesson	case study
11	3	Using remote sensing technology to combat desertification	Using remote sensing technology to combat desertification	Lecture and discussion	Listening ask questions
12	3	Indicators of implementation of the United Nations Convention	Indicators of the implementation of the United Nations Convention to Combat Desertification in the Arab World and the World	Dialogue and criticism	case studies
13	3	The most important results of Arab	The most important results of Arab	Lecture and discussion	mini lesson discussion

		experiments in developing indicators of desertification and its control	**experiments in developing indicators of desertification and its control**		
14	**3**	**desertification in Iraq**	**Desertification in Iraq: its prevalence, causes and consequences for the social and economic situation**	**Dialogue and criticism**	**Listening ask questions**
15	**3**	**Indicators to combat desertification in Iraq**	**Indicators to combat desertification in Iraq**	**Discussion and mini lesson**	**case studies**

11. Course Evaluation

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12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**syllabus**
Main references (sources)	**Soil salinity book d. Ahmed al-Zubaidi**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	