

**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

2026–2025

Academic Program Description Form

University Name: Al-Muthanna University

Faculty/ Institute: Agriculture College

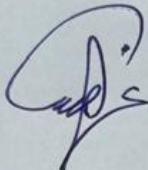
Scientific Department: Department of Combating Desertification

Academic or Professional Program Name: Bachelor of Agricultural Sciences

Final Certificate Name: Bachelor of Agricultural Sciences

Academic Preparation Date: 2-11-2025

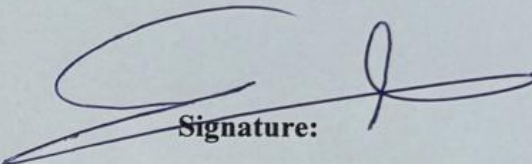
File Completion Date: 7-12-2025

Signature: 

Head of Department Name:

Prof. Dr. Ghanem Bahlol Noni

Date: 25-1-2026

Signature: 

Scientific Associate Name:

Prof. Dr. Hanoon Nahi Kadhum

Date: 26-1-2026

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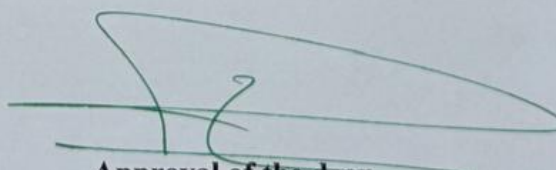
Department of Quality Assurance and University Performance

Director of the Quality Assurance and Performance Department:

Ass. Prof. Dr. Saad Kadhum Jabbar

Date: 27-1-2026

Signature:


Approval of the dean

Ass. Prof. Dr. Haider Abdul-Hussain Muhsen

MODULE DESCRIPTION FORM

Module Information			
Module Title	desert environment	Module Delivery	
Module Type	(C) College Requirment		
Module Code	DEC-122		
ECTSCredits	8		
SWL(hr./Sem)	200		
Module Level	1		
Administration Department	Combating • Desertification	Collage	College of Agricultural Engineering Sciences
Module Leader	Asst. Prof. Dr. Imad Abdel Karim Muhammad Reda	e-mail	emad.aldahab@mu.edu.iq
Module Leader's Acad11tle		Module Leader's Qualification	
Module Tutor	•	e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	22/9/2024	Version Number	1.0
Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	<p>The Desert Environment course, offered to students in the Department of Combating Desertification in the College of Agricultural Engineering Sciences, aims to provide students with basic knowledge about the characteristics of desert environments and their environmental and agricultural impacts. Students learn about the climatic and environmental challenges facing deserts and how to cope with the scarcity of natural resources such as water. They are also taught soil conservation strategies and desertification control techniques, including sustainable land management. The course focuses on the study of desert ecosystems, their biodiversity, and how to promote the cultivation of plants suitable for these conditions. Additionally, the course addresses practical methods for developing agricultural projects in desert areas, enhancing environmental awareness and scientific research skills related to desertification and arid environments</p>
Module Learning Outcomes	<p>Understanding Desert Ecosystems: Students will gain a comprehensive understanding of the characteristics and functioning of desert ecosystems, including climate, soil, and biodiversity</p> <p>Desertification Control Techniques: Students will be able to apply sustainable land management and desertification control techniques to mitigate the effects of land degradation in arid environments</p> <p>Water Resource Management: Students will learn how to efficiently manage scarce water resources in desert environments, including the use of innovative irrigation methods and water conservation</p> <p>Environmental Impact Assessment: Students will develop skills to assess the environmental impact of human activities in desert areas and propose solutions that enhance ecological balance</p> <p>Practical Agricultural Solutions: Students will be able to design and implement agricultural projects suitable for desert environments, including soil conservation techniques for</p>
Indicative Contents	<p>This course covers the characteristics of desert environments and their associated ecosystems, with a focus on water resource management and conservation strategies. The causes of desertification and sustainable methods for combating it are addressed, along with a review of the biodiversity of plants and animals adapted to desert conditions. The content also covers</p>

Learning and Teaching Strategies

Strategies	<p>Theoretical Lectures: Introducing basic concepts about desert environments and Practical and Field Learning: Conducting field visits to desert areas to study local soils and plants and applying practical techniques to combat desertification.</p> <p>Project-Based Learning: Assigning students to prepare research projects on sustainable agriculture strategies or the reclamation of degraded lands in desert environments.</p> <p>Group Discussions: Encouraging students to participate in discussions on environmental issues related to desertification and their solutions, which promotes critical thinking.</p> <p>Cooperative Learning: Organizing working groups where students collaborate to solve environmental problems and challenges associated with desert environments</p>
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Student Workload (SWL)

Structured SWL (h/Sem)	78	Structured SWL (h/w)	5
Unstructured SWL (h/Sem)	122	Unstructured SWL (h/w)	8.1
Total SWL (h/Sem)	200		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10%(10)	4,8,12	(1-3); (4-7); (10-11)
	Assignments	2	10%(10)	5,9	(1-4);(4-8)
	Projects / Lab. report	1	15%(15)	continue	all
		1	5%(5)	11	all
Summative assessment	Midterm Exam	2hr.	10%	10	1-9
	Final Exam	3hr.	50%	16	all
Total assessment					

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week1	Ecology and its Relationship to Other Sciences
Week2	Divisions and Components of Ecology
Week3	Definition of the Desert Environment
Week4	Characteristics of the Desert Environment
Week5	Location of the Desert Environment
Week6	Climate of the Desert Environment
Week 7	Problems of the Desert Environment
Week 9	Applications of Artificial Intelligence in Predicting Climate Change and Analyzing the Desert Environment
Week9	First Exam
Week 10	Plants of the Desert Environment
Week11	Definition of Deserts, Their Types, and Characteristics

Week12	Classification of Iraqi Deserts
Week13	Desert Soils
Week14	Reclamation of Desert Soils
Week15	Artificial Intelligence in Ecosystem Restoration and Identifying Plants Suitable for Desert Environments
Week16	Second Exam

15

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week1	Analyzing desert soil properties
Week2	Measuring desertification rates
Week3	Measuring factors affecting different environments: temperature, wind speed, light, turbidity, evaporation, and current speed
Week4	Cultivating plants adapted to desert environments
Week5	Managing water resources in deserts
Week6	Environmental analysis of desert plants
Week7	Evaluating desert biodiversity
Week 8	Exam One
Week9	Analysis of the impact of climate change on deserts
Week10	Soil conservation techniques
Week11	Reintroducing degraded plants
Week12	Analysis of groundwater in deserts
Week13	Preparing small-scale models of desert ecosystems

Week 14	Using modern technologies to combat desertification
Week 15	Exam Two

Learning and Teaching Resources		
	Text	Available In the Library?
Required Texts	The Hot Desert Environment: Written by Dr. Abdul Salam Mahmoud Nouri and Dr. Abdullah bin Mohammed Al-Ansari Development and the Environment in Desert and Arid Lands: Written by Dr. Ibrahim Abdul Bari Badr The Hot Desert Environment: Prepared by Al-Jawhara Al-Shaib	Not available in free education at the college and in the college library

Grading Scheme			
Grade	Evaluation	Marks %	Definition
A	Excellent	90 – 100	Outstanding Performance
B	Very Good	80 – 89	Above average with some errors
C	Good	70 – 79	Sound work with notable errors
D	Satisfactory	60 – 69	Fair but with major shortcomings
E	Sufficient	50 – 59	Work meets minimum criteria
FX	Fail	(45-49)	More work required but credit awarded
F	Fail	(0-44)	Considerable amount of work required
<p>Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p>			

Second stage

Course Description Form

Course Name:	
1- Agricultural machinery and equipment	
Course Code:	
Semester / Year: 2023-2024	
Description Preparation Date:1-9-2023	
Available Attendance Forms: Attended	
Number of Credit Hours (60) / Number of Units (3)	
Course administrator's name (mention all, if more than one name)	
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq	
Course Objectives	
Course Objectives	is machinery used in farming or other agriculture. There are many types of such equipment, from hand tools and power tools to tractors and the countless kinds of farm implements that they tow or operate. Diverse arrays of equipment are used in both organic and nonorganic farming. Especially since the advent of mechanized agriculture, agricultural machinery is an indispensable part of how the world is fed
Teaching and Learning Strategies	
Strategy	

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Classification of tractors , Mechanical transmission methods		Theoretical + practical lecture	Test
2	4	Internal combustion engine parts		Theoretical + practical lecture	Test
3	4	Four – stroke cycle& Two – stroke cycle		Theoretical + practical lecture	Test
4	4	Timer device		Theoretical + practical lecture	Test
5	4	Clutch Device		Theoretical + practical lecture	Test
6	4	Gearbox and Transmission devices		Theoretical + practical lecture	Test
7	4	Fuel System		Theoretical + practical lecture	Test
8	4	Cooling System		Theoretical + practical lecture	Test
9	4	Lubrication System		Theoretical + practical lecture	Test
10	4	Hydraulic devices. Power take - off shaft		Theoretical + practical lecture	Test
11	4	Soil preparation equipment		Theoretical + practical lecture	Test
12	4	Control equipment - Spraying equipment		Theoretical + practical lecture	Test
13	4	Fogging equipment		Theoretical + practical lecture	Test

14	4	Sprinkler calibration		Theoretical + practical lecture	Test
15	4	Maintenance of control equipment		Theoretical + practical lecture	Test

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)	Agricultural machinery
Main references (sources)	Basic Farm Machinery .J.M.shippen,C.R.E and C.H.Clover
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:
2- Lands leveling and grading
Course Code:
Semester / Year: 2023-2024
Description Preparation Date:1-9-2023
Available Attendance Forms: Attended
Number of Credit Hours (60) / Number of Units (3)
Course administrator's name (mention all, if more than one name)
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq

Course Objectives

Course Objectives	<p>Increasing the production of agricultural crops in quantity and quality due to the distribution of water in the field at approximately one depth</p> <p>Ease of irrigation, as the water is distributed evenly throughout the field. This means reducing the amount of water required by the irrigation process and reducing the effort and time required for this process, unlike uneven lands that require a large amount of irrigation water in addition to the greater time and effort to do</p>
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Teaching and Learning Strategies

Strategy	<p>1- Create a slope that provides an appropriate amount of water</p> <p>2- Leveling the field in the best way using the least possible amount of soil transport for the purpose of leveling</p>
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Definition of the Lands leveling and grading		Theoretical + practical lecture	Test
2	4	Types of leveling - application requirements		Theoretical + practical lecture	Test
3	4	the factors that must be followed before starting work to level and modify: soil factors, environmental factors, plants, and human factors		Theoretical + practical lecture	Test
4	4	Topographic variation: its relationship to of level - estimation methods - direct methods - indirect methods		Theoretical + practical lecture	Test
5	4	Land leveling without slope		Theoretical +	Test

				practical lecture	
6	4	Field works - implementation methods - work stages - calculations and estimation		Theoretical + practical lecture	Test
7	4	the leveling ground with one slope		Theoretical + practical lecture	Test
8	4	the leveling ground with two slope		Theoretical + practical lecture	Test
9	4	Calculations, estimates and evaluation		Theoretical + practical lecture	Test
10	4	Selection of machines		Theoretical + practical lecture	Test
11	4	Types of machines - testing standards - efficiency and utilization of machines		Theoretical + practical lecture	Test
12	4	Laser leveling		Theoretical + practical lecture	Test
13	4	Make a leveling plan		Theoretical + practical lecture	Test
14	4	Times for leveling - and ways to succeed		Theoretical + practical lecture	Test
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)			Surveying		

Main references (sources)	Basic Farm Machinery .J.M.shippen,C.R.E and C.H.Clover
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:
3- pasture management
Course Code:
Semester / Year:
Description Preparation Date:
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)
Name: sadeq Hadi Hussein

Email: Sadeq.hadi@mu.edu.iq

Course Objectives

Course Objectives

- Taking care of weekly duties
- Active participation of students after asking questions
- Repeat the lecture from last week by one or two students

Teaching and Learning Strategies

Strategy

- Introducing students to farm management
- The role of management in managing the resources involved in the production process

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- Introduction to farm management 2-The nature of the costs 3- The principle of equal marginal returns 4- The principle of		

			<p>determining and</p> <p>determining the best</p> <p>level of production</p> <p>5- The principle of</p> <p>opportunity costs</p> <p>6-Comparative costs</p> <p>theory</p> <p>7- Farm budget</p> <p>8- Farm accounts and</p> <p>records</p> <p>9- Agricultural planning</p> <p>10- Measures of</p> <p>economic efficiency on</p> <p>the farm</p>		
Course Evaluation					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)		Farm Business Management - Hashem Alwan Al-Samarrai			
Main references (sources)		Economics of agricultural production - Salem Tawfiq Al-Najafi			

Course Objectives					
Course Objectives		<ul style="list-style-type: none"> * Introducing the student to the nature of microbiology * Different types of microorganisms * The use of microorganisms in the agricultural field 			
Teaching and Learning Strategies					
Strategies	<ul style="list-style-type: none"> - Cognitive objectives <ul style="list-style-type: none"> * Enables the student to understand the nature of microorganisms * Enabling the student to distinguish between different types of microorganisms * Enabling the student to focus on the vital activities of all species * Enabling the student to know the importance of microorganisms in the agricultural field B- Skills goals <ul style="list-style-type: none"> - Development of bacteria and fungi - Isolate and purify it - Testing its sensitivity to antibiotics 				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first			A historical overview of microbiology, definition of microbiology, its types, and its relationship to other sciences	Direct lecture	

second			Bacteria, their shapes and composition		
Third			Different metabolic activities of bacteria		
forth			Fungi, their general characteristics and types		
Fifth			Different metabolic activities of fungi and their classification		
Sixth			Monthly exam		
Seventh			Viruses, their definition, structure and types		
Eighth			Types of virus replication		
Ninth			Algae definition, structure and type		
tenth			Biofertilizers, their types and importance		
11			Second part of biofertilizers		
12			Second monthly exam		
13			Protozoa , its definition, structure and sections		
14			General Review		
15			Comprehensive exam		
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, any)			General microbiology		
Main references (sources)			Books related to the subject a scientific research		

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:
5- agriculture extension principle
Course Code:
Semester / Year:
Description Preparation Date:
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)

Name: sadeq Hadi Hussein

Email: Sadeq.hadi@mu.edu.iq

Course Objectives

Course Objectives

- Participation in the classroom
- Requesting weekly assignments to be submitted
- Quick and surprise exam in the previous lecture
- Monthly tests
- Choose a title from the lectures and make a report that the student delivers in class

Teaching and Learning Strategies

Strategy

- Teaching and introducing students to the most important link in the agricultural extension system, which is the agricultural guide and his role in transferring scientific material from scientific research departments and delivering it to farms with some ease and guidance.
- Teaching students the art of adopting positive ideas in the field of agriculture

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- A historical overview of agricultural extension 2- Types of extension		

			<p>training</p> <p>3- Communication process</p> <p>4- The process of adoption and spread of modern innovations</p> <p>5- Rural leadership</p> <p>6- Planning extension programs</p> <p>7- Agricultural extension methods and extension methods</p> <p>8- The philosophy of agricultural extension</p> <p>9- Learning and teaching</p> <p>10- The importance of using modern irrigation methods and their economic effects</p> <p>11- The role of agricultural extension in preserving archaeological areas</p>		
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Course administrator's name (mention all, if more than one name)

Name: Assistant Professor samer saud
 Email: @mu.edu.iq

Course Objectives

Course Objectives

*** This course description provides a necessary summary of the most important characteristics the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available learning opportunities, and this must be linked the program description.**

1- Getting to know office programs, including (Excel).

2- Managing databases using Excel

1-The ability to work in all areas of computer use.

2- Increasing the spirit of competition among students for the sake of academic excellence a obtaining good job opportunities.

3- Increasing competition among students in order to obtain the opportunity to apply for postgraduate studies

4- Providing assistance to other institutions.

Teaching and Learning Strategies

Strateg

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Course Structure

Week	Hours	Require d Learning Outcom es	Unit or subject name	Learning method	Evaluation method
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first			A historical overview of microbiology, definition of microbiology, its types, and its relationship to other sciences	Direct lecture	
second			Familiarity with office programs		
Third			The main interface of Excel		
forth			Save Excel workbooks, autosave, and save edits		
Fifth			Create and manipulate tables in Excel		
Sixth			Identify the types of data that can be entered into Excel cells		
Seventh			First month exam		
Eighth			Writing equations in Excel		
Ninth			Ready-made formulas		
tenth			Types of functions in Excel		
11			How to write a function and get results		
12			Second monthly exam		
13			Table and text formats		
14			Search, replace and alphabet		
15			Practical applications		
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, any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:
7- English course
Course Code:
Semester / Year: Semester
Description Preparation Date:
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)

2hours weekly					
Course administrator's name (mention all, if more than one name)					
Name: Lafta Awad Atshan Email: lafta.awad@mu.edu.iq					
Course Objectives					
Course Objectives			English language skills		
Teaching and Learning Strategies					
Strategy					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Sentences strictures		
2	2		Past tense		
3	2		Past simple		
4	2		Past continuous		
5	2		Present tenses		
6	2		Present Simple		
7	2		Present continuous		
8	2		Future tense		
9	2		Future simple		
10	2		Paragraphs writing		
11	2		Paragraphs writing		
12	2		Paragraphs writing		
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)					
Main references (sources)			Cambridge English: Preliminary		
Recommended books and references (scientific journals, reports...)			Cambridge English: Preliminary		

Electronic References, Websites	An English videos
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Course Description Form

Course Name:
8- Principles of animal production
Course Code:
001110
Semester / Year:
The first stage/ autumn semester
Description Preparation Date:
26/2/2024

Available Attendance Forms:					
Presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical hours and 3 practical hours. Number of units: 3					
Course administrator's name (mention all, if more than one name)					
Name: Ass. Prof. Saad Atallah Abd sada Email: asadata@mu.edu.iq					
Course Objectives					
Course Objectives			<ul style="list-style-type: none"> It aims for the student to recognize the economic importance of animal production, as well as the sciences associated with it and the relationship of animal production to plant production. 		
Teaching and Learning Strategies					
Strategy		1 Explanation and clarification 2 Lecture method 3 Student groups 4 Practical lessons in laboratories			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Introduction to animal production and its economic importance	A lecture	Quiz
2	2	Theoretical lecture	Factors affecting the production efficiency of farm animals	A lecture	Quiz
3	2	Theoretical lecture	Obstacles facing	A lecture	Quiz

			animal production in Iraq and ways to improve them		
4	2	Theoretical lecture	Dairy cows, beef cows and dual-purpose cows	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Establishing and managing a flock of sheep and goats	A lecture	Quiz
7	2	Theoretical lecture	Buffalo, general characteristics of buffalo	A lecture	Quiz
8	2	Theoretical lecture	Poultry birds, the economic importance of poultry projects	A lecture	Quiz
9	2	Theoretical lecture	Nutrition and fodder	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Health care for poultry birds	A lecture	Quiz
12	2	Theoretical lecture	Genetic improvement in poultry	A lecture	Quiz
13	2	Theoretical lecture	Sheep and goats economic importance	A lecture	Quiz
14	2	Theoretical lecture	Classification and methods used for classification	A lecture	Quiz
15	2	Theoretical lecture	Sheep breeding	A lecture	Quiz

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)

Animal Production
Zuhair Al-Jalili

Main references (sources)

From methodological books, help books, the Internet, and scientific research

Recommended books and references (scientific journals, reports...)

Scientific journals in basic specializations

Electronic References, Websites	Animal Science Journal
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Course Description Form

Course Name:
9– Principles of soil science
Course Code:
0C1301
Semester / Year:
The first stage/ autumn semester
Description Preparation Date:
26/2/2024

Available Attendance Forms:					
Presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical hours and 3 practical hours. Number of units: 3					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Raheem Alwan Halool Email: raheemhalol@mu.edu.iq					
Course Objectives					
Course Objectives		<ul style="list-style-type: none"> • Introducing the student to the properties of soil • Knowing the types of soil clays • Classification of soils and lands in Iraq 			
Teaching and Learning Strategies					
Strategy		1 Explanation and clarification 2 Lecture method 3 Student groups 4 Practical lessons in laboratories			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	General definitions and concepts of soil	A lecture	Quiz
2	2	Theoretical lecture	Origin and development of soil	A lecture	Quiz
3	2	Theoretical lecture	Physical properties of soil	A lecture	Quiz
4	2	Theoretical lecture	Physical properties of soil	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Soil water	A lecture	Quiz

7	2	Theoretical lecture	Colloids and soil chemical properties	A lecture	Quiz
8	2	Theoretical lecture	Types of soil clays and their respective characteristics	A lecture	Quiz
9	2	Theoretical lecture	Organic colloids	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Soil salinity	A lecture	Quiz
12	2	Theoretical lecture	Classification of soils affected by salinity	A lecture	Quiz
13	2	Theoretical lecture	Biological properties of soil	A lecture	Quiz
14	2	Theoretical lecture	Important nutrients in the soil	A lecture	Quiz
15	2	Theoretical lecture	Classification of soils and lands in Iraq	A lecture	Quiz

Co2course 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)	Soil Science Abdullah Najim Al-Ani
Main references (sources)	From methodological books, help books, the Internet, and scientific research
Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	https://mail.almerja.com/reading.php?idm=195342

Course Description Form

Course Name:

10- Principles of protection

Course Code:					
0C1210					
Semester / Year:					
The first stage/ autumn semester					
Description Preparation Date:					
26/2/2024					
Available Attendance Forms:					
Presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical hours and 3 practical hours. Number of units: 3					
Course administrator's name (mention all, if more than one name)					
Name: Ass. Prof. Dr. Malik Hassan Kareem Email: malikhassan@mu.edu.iq					
Course Objectives					
Course Objectives			<ul style="list-style-type: none"> • It aims to familiarize the student with entomology and its related sciences, insects, their benefits and harms. 		
Teaching and Learning Strategies					
Strategy		1 Explanation and clarification 2 Lecture method 3 Student groups 4 Practical lessons in laboratories			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Introduction to	A lecture	Quiz

			entomology		
2	2	Theoretical lecture	Insect feeding methods and auxiliary factors	A lecture	Quiz
3	2	Theoretical lecture	Methods of insect reproduction	A lecture	Quiz
4	2	Theoretical lecture	Methods of insect resistance	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	The economic mastitis and important factors	A lecture	Quiz
7	2	Theoretical lecture	The nature of life and damage of rodents	A lecture	Quiz
8	2	Theoretical lecture	Economic importance of pests	A lecture	Quiz
9	2	Theoretical lecture	Definitions of disease terms	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Plant pathogens	A lecture	Quiz
12	2	Theoretical lecture	Non-parasitic pathogens	A lecture	Quiz
13	2	Theoretical lecture	Stages of disease development	A lecture	Quiz
14	2	Theoretical lecture	Methods of controlling plant diseases	A lecture	Quiz
15	2	Theoretical lecture	Rodent control	A lecture	Quiz

Co2urse 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)	General entomology Ibrahim Qaddouri Al-Qaddo
Main references (sources)	From methodological books, help books, the Internet, and scientific research
Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	https://www.uoanbar.edu.iq/eStoreImages/Bank/926.pdf

Course Description Form

Course Name:	
11- Arabic Language	
Course Code:	
Semester / Year:	
The first stage/spring semester	
Description Preparation Date:	
26/2/2024	
Available Attendance Forms:	
Presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours Number of units: 2	
Course administrator's name (mention all, if more than one name)	
Name: Ass. Lecturer Amer Mousa Kadhum Email: amermousak@mu.edu.iq	
Course Objectives	
Course Objectives	Teaching the student grammar and parsing, as well as rhetoric in the Holy Quran.
Teaching and Learning Strategies	
Strategy	1 Explanation and clarification 2 Lecture method

	3 Student groups 4 Practical lessons in laboratories
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Rhetoric in the Holy Quran	A lecture	Quiz
2	2	Theoretical lecture	Interpretation of twenty verses	A lecture	Quiz
3	2	Theoretical lecture	Arabic / Grammar and parsing	A lecture	Quiz
4	2	Theoretical lecture	The subject and the predicate	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Copiers	A lecture	Quiz
7	2	Theoretical lecture	Imperfect verbs	A lecture	Quiz
8	2	Theoretical lecture	Effects	A lecture	Quiz
9	2	Theoretical lecture	Preparation	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Hamza and dictates	A lecture	Quiz
12	2	Theoretical lecture	Rules for writing ta'	A lecture	Quiz
13	2	Theoretical lecture	Ages of Arabic literature	A lecture	Quiz
14	2	Theoretical lecture	Old poetry	A lecture	Quiz
15	2	Theoretical lecture	Writing common mistakes	A lecture	Quiz

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 any)	Arabic language Rafid Sabbah
Main references (sources)	From methodological books, help books, the Internet, and scientific research
Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	https://www.wuduh1.com/2023/10/books-arabic.html

Course Description Form

Course Name:	
12- Cultivation of desert lands	
Course Code:	
Semester / Year:	
the first	
Description Preparation Date:	
1/9/2023	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
Course administrator's name (mention all, if more than one name)	
Name: Dhafer Abdulrheem Shaker Email: dhaferabdshaker@mu.edu.iq	
Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • Learn how to maintain desert soil. • Identify methods for multiplying vegetable crops. • Identifying vegetable crops that can be grown in

	<p>desert areas.</p> <ul style="list-style-type: none"> • Reaching maximum production by using the optimal farming method and the best modern irrigation methods. • Using protected agriculture in vegetable production.
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Teaching and Learning Strategies

Strategy

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first	2	Identify the environmental requirements of vegetable crops grown in desert areas	the environmental requirements of vegetable crops grown in desert areas	Attend	a daily test
the second	2	Identifying the agricultural patterns adopted for farming desert areas	the agricultural patterns adopted for farming desert are	Attend	a daily test
the third	2	Identifying vegetable crops that can be grown in desert areas: the Solanaceae family.	vegetable crops that can be grown in desert areas : the Solanaceae family.	Attend	a daily test
the fourth	2	Getting to know the cucurbit family.	know the cucurbit family.	Attend	a daily test
Fifth	2	Identifying the Allium family and the Tuber family.	the Allium family and the Tuber family.	Attend	a daily test
VI	2	Identify the original homeland of the olive tree	the original homeland of the olive tree	Attend	a daily test
Seventh	2	Identify pollination in olives	pollination in olives	Attend	a daily test
VIII	2	Identify the environmental needs of olives	the environmental needs of olives	Attend	a daily test
Ninth	2	Learn about the botanical description of the palm tree	the botanical description of palm tree	Attend	a daily test
The tenth	2	Identifying palm propagation	palm propagation		

		(with pits, shoots, and shoots)	(with pits, shoots, and shoots)	Attend	a daily test
eleventh	2	Identify woody plants, their advantages and characteristics	woody plants, their advantages and characteristics	Attend	a daily test
twelveth	2	Learn about the benefits and uses of trees	the benefits and uses of trees	Attend	a daily test
Thirteenth	2	Identify the divisions of trees based on their tolerance to environmental conditions	the divisions of trees based on their tolerance to environmental conditions	Attend	a daily test
fourteenth	2	Learn about the methods of reproduction of trees and shrubs	the methods of reproduction of trees and shrubs	Attend	a daily test
Fifteenth	2	Identify the most important trees and shrubs	the most important trees and shrubs	Attend	a daily test

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)

Main references (sources)

**Cultivation of desert lands. Written by Abdullah Qasim Abdullah and Yahya Hussein.
Basics of growing and producing vegetables in protected and open lands
Desert. Written by Sayed Fathi**

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Third stage

Course Description Form

Course Name:
13- Water harvesting
Course Code:
Semester / Year: Third

Description Preparation Date: 2023-2024					
Available Attendance Forms: In person + electronic					
Number of Credit Hours (Total) / Number of Units (Total)					
Number of Credit Hours (Total) 30 hours					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Muhammad Radwan Mahmoud Email: modrn@mu.edu.iq					
Course Objectives					
Course Objectives <ul style="list-style-type: none"> • Strengthening efforts aimed at using and properly managing water resources. • Develop a future vision for developing water harvesting technologies to support water resource • Increasing the volume of irrigation water available for agricultural use, by adding dams, tanks, irrigation canals, and drilling wells, in addition to development projects in this field and water supply projects. 			<p>The student will be familiar with the mechanism of water harvesting</p> <p>Introducing the student to Water harvesting</p>		
Teaching and Learning Strategies					
Strategy		Strategic teaching and learning methods Audio methods (teaching explanation of the topic) Style of writing on the blackboard The method of direct dialogue between the teacher and the student, with student's evaluation in class participation Conduct experiments.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first	2	Theoretical	Introduction (definition of		Exams ,

week			water harvesting, main components of water harvesting system, determining factors of water harvesting system, benefits of water harvesting)		reports, discussions
second week	2Theoretical		Rainwater harvesting techniques		Exams , reports, discussions
the third week	2Theoretical		Techniques for harvesting valley water (floods)		Exams , reports, discussions
fourth week	2Theoretical		Reliability of water provision,		Exams , reports, discussions
The fifth week	2Theoretical		, storage capacity estimate		Exams , reports, discussions
the sixth week	2Theoretical		total rainfall amount, catchment area estimate		Exams , reports, discussions
Seventh week	2Theoretical		First monthly exam		Exams , reports, discussions
The eighth week	2Theoretical		Factors of circulating rainwater harvesting system		
Week nine	2Theoretical		Principles of planning for water harvesting projects		Exams , reports, discussions
The tenth week	2Theoretical		Water tanks		Exams , reports, discussions
Week eleven	2Theoretical		Sediments in tanks and their shelf life		Exams , reports, discussions
The twelfth week	2Theoretical		Dams, types of dams, their components, and dam collapse		Exams , reports, discussions
The thirteenth week	2Theoretical		Dams, types of dams, their components, and dam collapse		Exams , reports, discussions
The fourteenth week	2Theoretical		Dams, types of dams, their components, and dam collapse		Exams , reports, discussions
The fifteenth week			The second monthly exam		
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)	Justine Anschütz, Antoinette Kome, Marc Nederlof, Rob de Neef, Ton van de Ven 2012, Water harvesting and soil moisture retention	
Main references (sources)	Water harvesting and soil moisture retention Translated into Arabic Muhammad Radwan	صادر 2)
Recommended books and references (scientific journals, reports...)	Iraqi -reviewed journals /https://www.elsevier.com	
Electronic References, Websites	https://icwrae-psipw.org/papers/2006/Arabic/Water/A9.pdf	

Course Description Form

Course Name:
14- Soil Chemistry
Course Code:
Semester / Year:
Semester
Description Preparation Date:

27/2/2024

Available Attendance Forms:

Attend

Number of Credit Hours (Total) / Number of Units (Total)

4

3

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

Name: Assistant Professor Dr. bashar mezher jader

Email: bashar_mezher@mu.edu.iq

Course Objectives

Course Objectives

The soil chemistry course aims to explain principles used in studying the chemical composition of soil. During this course, the student is introduced to all the chemical properties of soil and how to estimate and calculate them practically and in the field. During this course, all chemical properties of soil are linked to other branches of soil science.

Teaching and Learning Strategies

Strategy

- Make the learner active and effective in educational situations.
- Teach students to respect different opinions and value others
- Benefit from other people's ideas and information.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	5	The importance of studying soil chemistry,	Soil chemistry	Explanation, presentation the model and lecture	Exam
the second	5	Ion exchange equations, physicochemical	Soil chemistry	Explanation, presentation the model and lecture	Exam

		equations			
the third	5	chemical equations, s anion exchar capacity	Soil chemist	Explanation, presentation the model and lecture	Exam
the fourth		Solubility balance in soil	Soil chemist	Explanation, presentation the model and lecture	Exam
Fifth		Carbonate equilibrium, CO ₂ -H ₂ O system, CaCO ₃ H ₂ O-CO ₂ system in soil	Soil chemist	Explanation, presentation the model and lecture	Exam
Sixth	5	Phosphorus balance, ionization phosphorus soil, phospho reactions	soil chemist	Explanation, presentation the model and lecture	Exam
Seventh	5	Chemical potential of ic in the soil syste - soil solution	Soil chemist	Explanation, presentation the model and lecture	Exam
Eighth	5	phosphorus dissolution Soil acidity a alkalinit	Soil chemist	Explanation, presentation the model and lecture	Exam
Ninth	5	curves in Al ₂ O ₃ -Fe ₂ O ₃ - CaO-P ₂ O ₅ -H ₂ system	Soil chemist	Explanation, presentation the model and lecture	Exam
Tenth	5	the importance studying degree of s reaction	Soil chemist	Explanation, presentation the model and lecture	Exam
Eleventh	5	sources of acid in the se methods	Soil chemist	Explanation, presentation the model and lecture	Exam

		measuring acidity and alkalinity			
Twelfth	5	effect of degree of reaction on cation exchange capacity.	Soil chemistry	Explanation, presentation of the model and lecture	Exam
Thirteenth		Equilibrium curves, buffering, acidity	Soil chemistry	Explanation, presentation of the model and lecture	Exam
Fourteenth		alkalinity of soils in dry and semi-arid areas and calcareous soils and gypsum soils.	Soil chemistry	Explanation, presentation of the model and lecture	Exam

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, any)	Soil chemistry
Main references (sources)	Books related to the subject and scientific research
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://onlinelibrary.wiley.com/doi/full/10.1002/97811190762.wsts0025

Course Description Form

Course Name:	
15- Soil fertility	
Course Code:	
Semester / Year:	
Second	
Description Preparation Date:	
26\2\2024	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Jaber Jassim Abu Talisha Email: Jaberalardy@mu.edu.iq	
Course Objectives	
Course Objectives	<p>The student gets to know the science of soil fertility</p> <ul style="list-style-type: none"> • The student should classify the types of elements and their importance to plants • The student should detail the factors affecting nutrient readiness • The student will be familiar with soil fertility evaluation • The student should evaluate the soil elements according to the importance to plants
Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1-Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	2	The student gets to know growth and the factors affecting it	Fertilizer technology	Explanation, presentation of model and lecture	the exam
the second	2	The student gets to know the types of nutrients	Fertilizer technology	Explanation, presentation of model and lecture	the exam
the third	2	The student recognizes the movement and absorption of elements in the soil	Fertilizer technology	Explanation, presentation of model and lecture	the exam
the fourth	2	The student gets to know the types of elements in the soil	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Fifth	2	The student gets to know the necessary elements	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Sixth	2	The student gets to know the major elements	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Seventh	2	The student gets to know the small elements	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Eighth	2	The student gets to know the use of and encouraging elements for growth	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Ninth	2	For the student to recognize the distinction between elements	Fertilizer technology	Explanation, presentation of model and lecture	the exam
The tenth	2	For the student to get to know the factors affecting the readiness of elements	Fertilizer technology	Explanation, presentation of model and lecture	the exam

Eleventh	2	The student gets to know nitrogen and its factors	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Twelfth	2	The student gets to know phosphorus and potassium and their factors	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Thirteenth	2	The student gets to know sulfur, calcium, magnesium, and trace elements	Fertilizer technology	Explanation, presentation of model and lecture	the exam
fourteenth	2	The student will be familiar with the evaluation of soil fertility	Fertilizer technology	Explanation, presentation of model and lecture	the exam
Fifteenth	2	The student will be familiar with the organic matter	Fertilizer technology	Explanation, presentation of model and lecture	the exam

Course Evaluation

1-Theoretical tests	25
2- Practical tests	15
3- Reports and studies	10
4- Final exam	50

Learning and Teaching Resources

Required text books (curricular books, if any)	Soil fertility 2014/a. Dr. Nour El-Din Shawky Ali
Main references (sources)	Fertilizer technologies and uses, 2012, Prof. Dr. Nour El-Din Shawqi Ali
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals
Electronic Websites	Soil Science Society Of America Library Genesis

Course Description Form

Course Name:					
16- a desert environment					
Course Code:					
Semester / Year:					
the second					
Description Preparation Date:					
28/1/2024					
Available Attendance Forms:					
Presence					
Number of Credit Hours (Total) / Number of Units (Total)					
30 hours/(2) units					
Course administrator's name (mention all, if more than one name)					
Name: Emad A.M.Aldahab Email: emad.aldahab@mu.edu.iq					
Course Objectives					
Course Objectives			Learn about the desert environment Factors leading to desertification Desert patterns		
Teaching and Learning Strategies					
Strategy		Strategy for the skill of thinking and making the appropriate decision, meaning that the student makes good decision when thinking about the desert environment and ways to overcome its negative effects			
Course Structure					
Week	Hours	Required	Unit or subject	Learning	Evaluation

		Learning Outcomes	name	method	method
the first	2	Learn about the classification of deserts	classification of deserts	Attend	a daily test
the second	2	Learn about the geography of deserts	geography of deserts	Attend	a daily test
the third	2	Identify climatic characteristics of hot deserts	climatic characteristics of hot deserts	Attend	a daily test
the fourth	2	Identify the relationship between rain and soil water content	relationship between rain and soil water content	Attend	a daily test
Fifth	2	First month examination	First month examination		
VI	2	Solve exercises related to the relationship between rain and soil water content in the desert	relationship between rain and soil water content in the desert	Attend	a daily test
Seventh	2	Recognizing dehydration	dehydration	Attend	a daily test
VIII	2	Identify dry regions and desertification	dry regions and desertification	Attend	a daily test
Ninth	2	Identify the patterns of dry regions and deserts	the patterns of dry regions and deserts	Attend	a daily test
The tenth	2	Identify desert plants and their types	desert plants and their types	Attend	a daily test
eleventh	2	Second month examination	Second month examination		

		exam	exam		
twelveth	2	Learn about the ways desert plants adapt to the desert climate	ways desert plants adapt to the desert climate	Attend	a daily test
Thirteenth	2	Identify the changes in the desert and climate of Iraq	the changes in the desert and climate of Iraq	Attend	a daily test
fourteenth	2	Learn how to develop the desert environment	develop the desert environment	Attend	a daily test
Fifteenth	2	Identifying living patterns of residents in the desert environment	living patterns of residents in the desert environment	Attend	a daily test

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)

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Course Description Form

Course Name:

17- the economics of nature

Course Code:

Semester / Year:	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
Course administrator's name (mention all, if more than one name)	
Name: sadeq Hadi Hussein	
Email: Sadeq.hadi@mu.edu.iq	
Course Objectives	
Course Objectives	<ul style="list-style-type: none"> -Active participation in the classroom -Rapid exams -Monthly tests are proof of understanding the lecture
Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1- Increase knowledge of natural resource economics. 2- Optimal exploitation of natural resources as they are viable resources 3- Teaching students the importance of natural resources and their role in the economic development of the country 4- Developing the student's ability to make people aware that natural resources belong to future generations as well as their current use

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- Natural resource economics 2- Land economics 3- Oil 4- Water resources 5- Human resources 6- Environment 7- Public goods and external factors 8- General expenses 9- Public revenues 10- Preserving natural resources 11- Sources of environmental pollution 12- Means of preserving natural resources		
Course Evaluation					
Natural Resource Economics - Hassoun Muhammad Ali					
Learning and Teaching Resources					

Required textbooks (curricular books, if any)	Economics of Animal Production - Salem Tawfiq Al-Najafi - Mosul Press
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:	
18- Soil-Plant-Water	
Course Code:	
Semester / Year:	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
Course administrator's name (mention all, if more than one name)	
Name: Qassim A. Talib Alshujairy Email: qassimtalib@mu.edu.iq	
Course Objectives	
Course Objectives	study Soil-Plant-Water course are to provide students with a understanding of the relationships between soil, water, and plants

Teaching and Learning Strategies

Strategy The strategies for a course on soil-plant-water interactions often involve a combination of theoretical knowledge, practical applications, and field experiences

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			Understanding Soil Properties: Soil-Water Movement: Plant-Water Relations: Soil-Water-Plant Interactions: Irrigation and Water Management: Soil and Water Conservation: Soil-Water Quality: Sustainable Agriculture: Climate Change Impacts: Applied Research and Technology: Fieldwork and Practical Skills:		

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

Course Description Form

Course Name:					
19- Desertification					
Course Code:					
Semester / Year:					
Description Preparation Date:					
Available Attendance Forms:					
Number of Credit Hours (Total) / Number of Units (Total)					
Course administrator's name (mention all, if more than one name)					
Name: Dhafer Abdulrheem Shaker					
Email: : dhaferabdshaker@mu.edu.iq					
Course Objectives					
Course Objectives					
Teaching and Learning Strategies					
Strategy					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			Introduction to the concept of desertification The problem of desertification, describing the forms of desertification and its causes The harms of desertification, its risks,		

			<p>and the losses resulting from it, desertification globally, Arably, and locally</p> <p>Origin of desertification.</p> <p>Vegetation, salinity, drought</p> <p>First month exam</p> <p>Combat Desertification.</p> <p>Agriculture and permaculture</p> <p>Water resources and combating desertification</p> <p>Sand dunes as a manifestation of desertification</p> <p>Area distribution of sand dunes locally and their spread globally.</p> <p>The origin of the sand dune problem. Sand dunes and sand dunes.</p> <p>Means and methods for measuring desertification and sand dunes</p> <p>Second month exam</p> <p>Erosion measurement.</p> <p>Measuring the ability of soil to be removed.</p> <p>Measuring loss and addition</p> <p>Drought and aridity</p> <p>Global Warming</p> <p>Water harvesting</p>		
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Course Evaluation					
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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					
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Learning and Teaching Resources					
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Required textbooks (curricular books, if any)					
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Main references (sources)					
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Recommended books and references					
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(scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:	
20- Soil physics	
Course Code:	
Semester / Year:	
THIRD	
Description Preparation Date:	
26\2\2024	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq	
Course Objectives	
Course Objecti	1- Researches the study of soil physics and the physical properties of soil 2- Study how to measure the physical properties of soil 3- Applying measurements of physical properties to solve scientific problems related agriculture and the environment 4- Understanding the relationship between physical soil properties 5- Knowing the movement of water in the soil and the flow of water in saturated and unsaturated soils.
Teaching and Learning Strategies	
Strategy	1-Explanation and clarification

- 2- Lecture method
- 3- Student groups
- 4- Practical lessons
- 5- Scientific trips
- 6 - Self-learning method

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	Introduction and definition of soil science, soil physics and some related relationships	Soil physics	Explanation, presentation of model and lecture	the exam
the second	4	Physical soil properties, soil texture, particle size distribution, and Stock's law	Soil physics	Explanation, presentation of model and lecture	the exam
the third	4	The specific area of soil and methods for determining soil physically and chemically	Soil physics	Explanation, presentation of model and lecture	the exam
the fourth	4	Soil Structure: its definition, importance, and how to study it	Soil physics	Explanation, presentation of model and lecture	the exam
Fifth	4	Methods of studying soil structure and evidence of soil structure	Soil physics	Explanation, presentation of model and lecture	the exam
Sixth	4	Stability of soil aggregates, methods of studying them, and factors affecting the formation of aggregates	Soil physics	Explanation, presentation of model and lecture	the exam
Seventh	4	Soil water and general water properties, soil air, air capacity and gas exchange in the soil	Soil physics	Explanation, presentation of model and lecture	the exam
Eighth	4	Water properties related to porous media (soil), soil water energy and methods for expressing and measuring it	Soil physics	Explanation, presentation of model and lecture	the exam
Ninth	4	Soil temperature, soil temperature, and heat flow in the soil	Soil physics	Explanation, presentation of model and lecture	the exam
The tenth	4	Water flow in saturated soil	Soil physics	Explanation,	the exam

		and water flow in unsaturated soils		presentation of model and lecture	
Eleventh	4	Water infiltration in soils and methods for measuring it and its equations	Soil physics	Explanation, presentation of model and lecture	the exam
Twelfth	4	Irrigation and drainage characteristics and the physical properties of surface soil	Soil physics	Explanation, presentation of model and lecture	the exam
Thirteenth	4	Water balance and energy balance in the field	Soil physics	Explanation, presentation of model and lecture	the exam
fourteenth	4	Evaluation of the water balance equation, water consumption and evapotranspiration	Soil physics	Explanation, presentation of model and lecture	the exam
Fifteenth	4		Soil physics	Explanation, presentation of model and lecture	the exam
Course Evaluation					
1-Theoretical tests		25			
2- Practical tests		15			
3- Reports and studies		10			
4- Final exam		50			
Learning and Teaching Resources					
Required textbooks (curriculum books, if any)		1- Soil Physics, written by Dr. Hisham Mahmoud Hassan 2000 2- Basics of soil physics, translation. Mahdi Ibrahim Odeh 1990			
Main references (sources)		Basics of soil physics, translation. Mahdi Ibrahim Odeh 1990			
Recommended books and references (scientific journals, reports...)		Iraqi academic scientific journals			
Electronic Websites		Referenc Soil physics			

Course Description Form

Course Name:	
21- remote sensing	
Course Code:	
Semester / Year:	
THIRD	
Description Preparation Date:	
26\2\2024	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq	
Course Objectives	
Course Objecti	<p>1- It examines the concept of remote sensing, and the elements and applications of remote sensing</p> <p>2- Researches the interactions of electromagnetic energy and spectral reflectivity and factors affecting them</p> <p>3- Knowing the sensors, their types and characteristics, as well as examining aerial and satellite images</p> <p>4- Studying methods for classifying satellite images</p> <p>5- The student's knowledge of geographic information systems (GIS) and their uses</p>
Teaching and Learning Strategies	
Strategy	<p>1-Explanation and clarification</p> <p>2- Lecture method</p> <p>3- Student groups</p> <p>4- Practical lessons</p> <p>5- Scientific trips</p> <p>6 - Self-learning method</p>

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	History and target of remote sensing	remote sensing	Explanation, presentation of model and lecture	the exam
the second	4	Electromagnetic energy and parts of the electromagnetic spectrum	remote sensing	Explanation, presentation of model and lecture	the exam
the third	4	Energy interaction with environmental components	remote sensing	Explanation, presentation of model and lecture	the exam
the fourth	4	Spectral reflectivity and factors affecting it	remote sensing	Explanation, presentation of model and lecture	the exam
Fifth	4	Aerial photography and its stages of development	remote sensing	Explanation, presentation of model and lecture	the exam
Sixth	4	Types of aerial photographs and their characteristics	remote sensing	Explanation, presentation of model and lecture	the exam
Seventh	4	Rules for classifying aerial photographs	remote sensing	Explanation, presentation of model and lecture	the exam
Eighth	4	Types of characteristics of space platforms	remote sensing	Explanation, presentation of model and lecture	the exam
Ninth	4	Types and characteristics of sensors	remote sensing	Explanation, presentation of model and lecture	the exam
The tenth	4	Types and properties of satellite data	remote sensing	Explanation, presentation of model and lecture	the exam
Eleventh	4	Satellite data sensing	remote sensing	Explanation, presentation of model and lecture	the exam
Twelfth	4	Methods of classifying satellite images	remote sensing	Explanation, presentation of model and lecture	the exam
Thirteenth	4	Remote sensing applications	remote sensing	Explanation, presentation of model and lecture	the exam
fourteenth	4	Geographic information systems	remote sensing	Explanation,	the exam

				presentation of model and lecture	
Fifteenth	4		remote sensing	Explanation, presentation of model and lecture	the exam
Course Evaluation					
1-Theoretical tests		25			
2- Practical tests		15			
3- Reports and studies		10			
4- Final exam		50			
Learning and Teaching Resources					
Required textbooks (curriculum books, if any)	Remote sensing science: Prof. Dr. Ahmed Saleh Al-Mashhadani M.D. Ahmed Madloul. 2014.				
Main references (sources)	Basics of remote sensing (Canada center for remote sensing)				
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals				
Electronic Websites	Referenc	Google earth ,USGS			

Course Description Form

Course Name:
22- Design and analysis experiments
Course Code:
Semester / Year:
THIRD
Description Preparation Date:
26\2\2024

Available Attendance Forms:					
Actual presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical		3 practical		units 3.5	
Course administrator's name (mention all, if more than one name)					
Name: Dr. Hadi Awad hasony Email: hadi_habeb2000@mu.edu.iq					
Course Objectives					
Course Objecti	<p>1* Informing the student that there are areas that depend on conducting experiments, and these experiments must be designed on scientific foundations</p> <p>* When analyzing experiments, it is done according to scientific methods and logical steps</p> <p>* Upon obtaining accurate results of the experiment, it leads us to make the appropriate decision</p> <p>* Introducing the student to many types of designs, as each experiment has a specific design</p> <p>* Introducing the student to how to test the significance of each mathematical model</p> <p>* Informing the student that there are tests conducted before the experiment and tests proposed after the experiment</p> <p>* Informing the student that there are values that can be lost during the experiment and that they can be estimated</p>				
Teaching and Learning Strategies					
Strategy	<p>1-Explanation and clarification</p> <p>2- Lecture method</p> <p>3- Student groups</p> <p>4- Practical lessons</p> <p>5- Scientific trip</p> <p>6 - Self-learning method</p>				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	A historical overview of statistics, definition of statistics,		Explanation, presentation of model and lecture	the exam

the second	4	division of statistics Measures of central tendency, measures of centralization		Explanation, presentation of model and lecture	the exam
the third	4	Measures of dispersion		Explanation, presentation of model and lecture	the exam
the fourth	4	Hypothesis testing, statistical errors, hypothesis t-test		Explanation, presentation of model and lecture	the exam
Fifth	4	Chi-square test		Explanation, presentation of model and lecture	the exam
Sixth	4	General concepts and definitions in designing and analyzing experiments,		Explanation, presentation of model and lecture	the exam
Seventh	4	Types of agricultural experiments, complete randomized design		Explanation, presentation of model and lecture	the exam
Eighth	4	lsd test		Explanation, presentation of model and lecture	the exam
Ninth	4	Randomized complete block design		Explanation, presentation of model and lecture	the exam
The tenth	4	Duncan's test		Explanation, presentation of model and lecture	the exam
Eleventh	4	Latin square design		Explanation, presentation of model and lecture	the exam
Twelfth	4	Global experiments		Explanation, presentation of model and lecture	the exam
Thirteenth	4	Factorial experiments with two factors		Explanation, presentation of model and lecture	the exam
fourteenth	4	Factorial experiments with three factors		Explanation, presentation of model and lecture	the exam
Fifteenth	4	Correlation and simple lin regression		Explanation, presentation of model and lecture	the exam

Course Evaluation	
1-Theoretical tests	25
2- Practical tests	15
3- Reports and studies	10
4- Final exam	50
Learning and Teaching Resources	
Required textbooks (curriculum books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic Websites	Referenc

Course Description Form

Course Name:
23- English course
Course Code:
Semester / Year: Semester
Description Preparation Date:

Available Attendance Forms:					
Number of Credit Hours (Total) / Number of Units (Total)					
2hours weekly					
Course administrator's name (mention all, if more than one name)					
Name: Lafta Awad Atshan Email: lafta.awad@mu.edu.iq					
Course Objectives					
Course Objectives			English language skills		
Teaching and Learning Strategies					
Strategy					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Sentences strictures		
2	2		Past tense		
3	2		Past simple		
4	2		Past continuous		
5	2		Present tenses		
6	2		Present Simple		
7	2		Present continuous		
8	2		Future tense		
9	2		Future simple		
10	2		Paragraphs writing		
11	2		Paragraphs writing		
12	2		Paragraphs writing		
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)	
Main references (sources)	Cambridge English: Preliminary
Recommended books and references (scientific journals, reports...)	Cambridge English: Preliminary
Electronic References, Websites	An English videos

Course Description Form

Course Name:
24- Irrigation
Course Code:
Semester / Year:
second
Description Preparation Date:
26\2\2024
Available Attendance Forms:

Actual presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical		3 practical		units 3.5	
Course administrator's name (mention all, if more than one name)					
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq					
Course Objectives					
Course Objecti	<p>1- Researches the science of irrigation, its sources, methods of controlling it, exploiting and delivering it to agricultural fields</p> <p>2- Study to evaluate the quality of irrigation water and its suitability for irrigation.</p> <p>3- Know how to plan, design and implement irrigation facilities</p> <p>4- It examines the relationship of water with soil, the movement of water in the soil, and the flow of water</p> <p>5- Calculating plant water consumption, water requirements, and irrigation scheduling in addition to irrigation water measurements</p> <p>6- It examines drainage, sources of excess water, and the relationship of drainage to plant growth and productivity, soil salinity, salt balance, and washing requirements.</p>				
Teaching and Learning Strategies					
Strategy	<p>1-Explanation and clarification</p> <p>2- Lecture method</p> <p>3- Student groups</p> <p>4- Practical lessons</p> <p>5- Scientific trips</p> <p>6 - Self-learning method</p>				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

first	4	The concept of irrigation, sources irrigation water, physical characteristics related to irrigation	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
the second	4	Irrigation water quality	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
the third	4	The relationship of water with soil - moisture, movement of water in the s	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
the fourth	4	Irrigation water measurements	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Fifth	4	Plant water consumption, water needs and irrigation scheduling	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Sixth	4	Transport and distribution of irrigation water, movement of water in pipes open channels	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Seventh	4	Adequacy and efficiency of irrigation and consistency of irrigation	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Eighth	4	Traditional irrigation methods	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Ninth	4	Modern irrigation methods	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
The tenth	4	Drainage concept, sources of excess water	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Eleventh	4	The relationship of drainage to plant growth and productivity	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Twelfth	4	Drainage, soil salinity, leaching requirements and salt balance	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Thirteenth	4	Types of drains: open, covered	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
fourteenth	4	Distribution patterns of the drain network, distance between drains maintenance of drains	Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Fifteenth	4		Irrigation and drainage	Explanation, presentation of model and lecture	the exam
Course Evaluation					
1-Theoretical tests		25			

2- Practical tests	15
3- Reports and studies	10
4- Final exam	50
Learning and Teaching Resources	
Required textbooks (curriculum books, if any)	<p>1-Irrigation, its basics and applications, written by Dr. Nabil Ibrahim Al-Tayef and Dr. Issam Khudair Hamza Al-Hadithi 1988 Ministry of Higher Education and Scientific Research - University of Baghdad.</p> <p>2-Irrigation and drainage, written by Dr. Laith Khalil Ismail 2000 Ministry of Higher Education and Scientific Research - University of Mosul</p> <p>3- Drainage (investigations, designs, implementation and maintenance). Dr. Mohsen Muhareb Awad Al-Lami and Dr. Al Saleh Abdul-Jabbar Al-Janabi. Iraq . Ministry of Higher Education and Scientific Research. University of Al Mosul .</p>
Main references (sources)	<p>1-Irrigation, its basics and applications, written by Dr. Nabil Ibrahim Al-Taif and Dr. Issam Khudair Hamza Al-Hadithi 1988 Ministry of Higher Education and Scientific Research - University of Baghdad</p> <p>2- Modern irrigation technologies and other topics in the water issue, written by Dr. Issam Khudair Al-Hadithi, Dr. Ahmed Madloul Al-Kubaisi, and Dr. Yas Khudair Hamza Al-Hadithi, 2010, Ministry of Higher Education and Scientific Research - Anbar University</p> <p>3- Irrigation and drainage, written by Dr. Laith Khalil Ismail 2000 Ministry of Higher Education and Scientific Research - University of Mosul</p>
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals
Electronic Websites	<p>Soil Science Society Of America</p> <p>Library Genesis</p>

Course Description Form

Course Name:	
25- Plant Physiology	
Course Code:	
Semester / Year:	
Second	
Description Preparation Date:	
26\2\2024	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. jabir jasim abwtlisha	
Email: Jaberalardy@mu.edu.iq	
Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • The student gets to know Plant Physiology • The student should classify of cells • The student should detail the benefits and harms of Metabolism , Respiration , Transpiration • The student should know about plant hormones
Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1-Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	2		Plant Physiology	Components a plant cell	the exam
the second	2		Plant Physiology	Osmosis	the exam
the third	2		Plant Physiology	Passive and active absorption	the exam
the fourth	2		Plant Physiology	Photosynthesis	the exam
Fifth	2		Plant Physiology	Respiration	the exam
Sixth	2		Plant Physiology	Growth Hormones	the exam
Seventh	2		Plant Physiology	Inhibitors of Hormones	the exam
Eighth	2		Plant Physiology	Enzymes	the exam
Ninth	2		Plant Physiology	Transpiration	the exam
The tenth	2		Plant Physiology	Guttation and bleeding	the exam
Eleventh	2		Plant Physiology	Colloidal solutions	the exam
Twelfth	2		Plant Physiology	Vernalization	the exam

Course Evaluation	
1-Theoretical tests	25
2- Practical tests	15
3- Reports and studies	10
4- Final exam	50
Learning and Teaching Resources	
Required textbo (curricular books, if any)	Plant Physiology . 2000. Dr.Mouaid Alyonis
Main references (source	Plant Physiology
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals
Electronic Referenc Websites	Plant Physiology Journal .

Course Description Form

Course Name:
26- Hydrology
Course Code:
Semester / Year:
Description Preparation Date:
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)

Name: Qassim A. Talib Alshujairy
 Email: qassimtalib@mu.edu.iq

Course Objectives

Course Objectives The objectives of a hydrology course are to provide students with a comprehensive understanding of the principles and processes of the hydrological cycle, the distribution, movement, and properties of water on Earth's surface and in the subsurface.

Teaching and Learning Strategies

Strategy

Lectures: Traditional classroom lectures are often used to present fundamental concepts, theories, and principles of hydrology. Lectures provide an opportunity for instructors to convey information, discuss theoretical frameworks, and highlight key concepts.

Laboratory Work: Hands-on laboratory sessions allow students to apply theoretical knowledge to practical situations. In hydrology courses, students may engage in activities such as water quality testing, flow measurements, and experiments related to hydrological processes.

Fieldwork: Field trips or fieldwork exercises provide students with direct exposure to real-world hydrological environments. This could include visits to watersheds, rivers, lakes, or groundwater monitoring sites to observe and analyze hydrological features and processes.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1. Understanding the Water Cycle 2. Watershed Analysis 3. Quantifying Precipitation and Runoff 4. Groundwater Hydrology 5. Hydrological Modeling 6. Hydrological Data Collection 7. Water Quality 8. Climate Change and Hydrology 9. Water Resource Management 10. Hydrological Engineering 11. Environmental Impact Assessment		

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)	Applied Hydrology Ray K. lensley et.al New York, USA
Main references (sources)	
Recommended books and references (scientific journals, reports...)	International Journal of Hydrology Science and Technology
Electronic References, Websites	

Course Description Form

Course Name:
27- Soil water plant and analysis
Course Code:
Semester / Year: Chapter Two/Four

Description Preparation Date:					
Available Attendance Forms:					
Actual presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical 0 practical units 2					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. G. B. Noni Email: ghanem-bahlol@mu.edu.iq					
Course Objectives					
Course Objectives		<p>For the student to know the types of analytical methods</p> <ul style="list-style-type: none"> • The student learns how to analysis water , soil and plant • The student should evaluate the scientific reality to maintain analytical methods 			
Teaching and Learning Strategies					
Strategy		<p>1- Explanation and clarification</p> <p>2- Lecture method</p> <p>3- Student groups</p> <p>4- Practical lessons</p> <p>5- Scientific trips</p> <p>6 - Self-learning method</p>			
Course Structure					
Week	Hou rs	Required Learning Outcomes	Unit or subject name	Learning method	Evaluatio n method

The first	5	The student gets to know introduction about water , soil plant analytical	ter , soil and plant analytical	Explanation, presentation of the model and lecture	the exam
The second	5	is for the student to know analytical of water			
Third	5	The student learns about soil analytical	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam
Fourth	5	The student gets to know plant analytical	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam
Fifth	5	: The student learns about methods of soil samples	Water , soil plant analytical	Explanation, presentation of the model and	the exam

				lecture	
Sixth	5	: The student learns about methods of plant samples	Water , soil and plant analytical	Explanation, presentation of the model and lecture	the exam
Seventh	5	: The student gets to know the methods of water samples methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Eighth		The student gets to know the quantitative and volumetric methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Ninth		The student gets to know the quantitative and weighing methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Tenth		: The student will learn about electrical of a Analytical methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam

Eleventh		The student gets to know About analytical of spectroscopy	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Twelfth	5	The student gets to know Atomic emission methods			the exam
th		: The student knows how the Atomic absorption methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fourteen		: The student gets to know Metal analysis methods	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam
Fifteenth		The student gets to know the types of X-	Water , soil plant analytical	Explanation, presentation of	the exam

		ray analysis methods		the model and lecture	
Course Evaluation					
Theoretical tests 40					
2- Practical tests -					
3- Reports and studies 10					
4- Final exam 50					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)					
Recommended books and references (scientific journals, reports...)			Iraqi academic scientific journals		
Electronic References, Websites			Soil Science Society Of America Library Genesis		

Forth stage

Course Description Form

Course Name:

28- Soil salinity and its melioratio					
Course Code:					
Semester / Year:					
Semester					
Description Preparation Date:					
27/2/2024					
Available Attendance Forms:					
Attend					
Number of Credit Hours (Total) / Number of Units (Total)					
4 3					
Course administrator's name (mention all, if more than one name)					
Name: Assistant Professor Dr. bashar mezher jader Email: bashar_mezher@mu.edu.iq					
Course Objectives					
Course Objectives		It investigates the spread of saline soils in the world and Iraq and its impact on agricultural production. It includes studying sources of salts in nature and soils and means of transport them, studying the effect of salts on plant growth and methods for increasing plants' resistance to salinity.			
Teaching and Learning Strategies					
Strategy	<ul style="list-style-type: none"> • Make the learner active and effective in educational situations. • Teach students to respect different opinions and value others • Benefit from other people's ideas and information. 				
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	5	The problem of salinity and impact on agricultural production, problem of salinity in Iraq in past and present	Salinity and reclamation	Explanation presentation the model lecture	exam

second	5	Sources of salt components	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
third	5	The effect of soil salinity on plants	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
the fourth	5	Classification and naming of soils affected by salts	Salinity and reclamation	and 1	Explanation presentation the model lecture	Exam
Fifth	5	Irrigation water quality	Salinity and reclamation	1	Explanation, presentation the model lecture	Exam
Sixth	5	Controlling salinity and ways to deal with it	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
Seventh		Land reclamation (decisions and requirements).	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
Eighth		Lands that need reclamation	Salinity and reclamation	and 1	Explanation presentation the model lecture	Exam
Ninth	5	Reclamation of salty lands	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
Tenth	5	Reclamation of sandy lands	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
Eleventh	5	Gypsum lands and their reclamation	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
Twelfth		Limestone lands and their reclamation	Salinity and reclamation	1	Explanation presentation the model lecture	Exam
Thirteenth	5	Waterlogged lands and their reclamation	Salinity and reclamation	1	Explanation presentation	Exam

				the model lecture	
fourteen		Desert lands and their reclamation	Salinity and reclamation	Explanation presentation the model lecture	Exam
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)			Soil salinity Soil melioration		
Main references (sources)			Books related to the subject a scientific research		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites			https://www.sciencedirect.com/topics/earth-and-planetary-sciences/soil-salinity		

Course Description Form

Course Name:
29- Soil microbiology
Course Code:
Semester / Year:

four					
Description Preparation Date:					
26\2\2024					
Available Attendance Forms:					
Actual presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical		3 practical		units 3.5	
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. G. B. Noni Email: ghanem-bahlol@mu.edu.iq					
Course Objectives					
Course Objecti	<p>The student gets to know the classification and types of Soil microbiology and their importance</p> <ul style="list-style-type: none"> • For the student to learn about methods of Soil microbiology • For the student to recognize method of Soil microbiology • The student should evaluate Soil microbiology 				
Teaching and Learning Strategies					
Strategy	<p>1-Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method</p>				
Course Structure					
Week	H ou rs	Required Learning Outcomes	Unit or subject name	Learning method	Evaluatio n method

first	2	Historical overview, definition, and	Soil Microbiology	Explanation, presentation of model and lecture	the exam
the second	2	importance of studying soil microbiology Sections of soil microbiology	Soil Microbiology	Explanation, presentation of model and lecture	the exam
the third	2	Soil microbial groups: bacteria, fungi, algae, actinomycetes, archaea, mycorrhizae.	Soil Microbiology	Explanation, presentation of model and lecture	the exam
the fourth	2	Organic matter: carbon cycle, enzymatic activity in soil	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Fifth	2	Biotransformations of N, nitrogen cycle, urea decomposition, nitrification process, mineralization and assimilation, C/N ratio	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Sixth	2	Biological nitrogen fixation	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Seventh	2	Biological transformations of phosphorus: its cycle and the role of microorganisms; its transformations	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Eighth	2	Biological transformations of phosphorus: its cycle and the role of microorganisms; its transformations	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Ninth	2	Biological transformations of sulfur: sulfur cycle, mineralization, microbial metabolism, oxidation, and reduction of inorganic sulfur compounds.	Soil Microbiology	Explanation, presentation of model and lecture	the exam
The tenth	2	Biotransformations of iron: oxidation, reduction, and decomposition of organic iron compounds	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Eleventh	2	Biotransformations of iron: oxidation, reduction, and decomposition of organic iron compounds	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Twelfth	2	Decomposition of pesticides in soil	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Thirteenth	2	Relationships between microorganisms and the area surrounding the root (rhizosphere) and the activity of microorganisms in this area	Soil Microbiology	Explanation, presentation of model and lecture	the exam

		Factors affecting the growth of			
fourteenth	2	microorganisms, growth	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Fifteenth	2	Factors affecting the growth of microorganisms, growth	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Course Evaluation					
1-Theoretical tests		25			
2- Practical tests		15			
3- Reports and studies		10			
4- Final exam		50			
Learning and Teaching Resources					
Required textbooks (curriculum books, if any)		11- Soil microbiology. 2012. Dr. Hadi Hassan.			
Main references (sources)					
Recommended books and references (scientific journals, reports...)		Iraqi academic scientific journals			
Electronic Websites		Soil Science Society Of America Library Genesis			

Course Description Form

Course Name:
30- Environmental stress
Course Code:

Semester / Year: Fourth					
Description Preparation Date: 2023-2024					
Available Attendance Forms: In person + electronic					
Number of Credit Hours (Total) / Number of Units (Total)					
Number of Credit Hours (Total) 75 hours					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Muhammad Radwan Mahmoud					
Email: modrn@mu.edu.iq					
Course Objectives					
<p>Course Objectives</p> <p>Course objectives</p> <p>Objectives of the study subject This course description provides a summary of the most important characteristics of the course and learning outcomes that the student is expected to achieve, demonstrating whether he or she has met the most of the learning opportunities available must be linked to the program description</p>			<p>the student will be familiar with the mechanism of effect of environmental stress on plants, and the forms effect</p> <p>introducing the student to the environmental stress resulting from extreme conditions and its effects on plants</p> <p>plants resist that effect, and what the damage resulting from that effect are</p>		
Teaching and Learning Strategies					
Strategy		<p>Strategic teaching and learning methods</p> <p>Audio methods (teaching explanation of the topic)</p> <p>Style of writing on the blackboard</p> <p>The method of direct dialogue between the teacher and the student, with student's evaluation in class participation</p> <p>Conduct experiments.</p>			
Course Structure					
Week	Hours	Required Learning	Unit or subject name	Learning	Evaluation

		Outcomes		method	method
The first week	2Theoretic 3 Practica		An introduction to the type stress Stress measurement methods		Exams , reports, discussions
second week	2Theoretic 3 Practica		Mechanism of the effect of stress on metabolism)construction and demolition Stress simulation methods		Exams , reports, discussions
the third week	2Theoretic 3 Practica		Water stress The movement of water in the plant at The occurrence of water tension		Exams , reports, discussions
fourth week	2Theoretic 3 Practica		The effect of water stress on Physiological processes Anatomical comparison between plants Stress-prone plants Water balanced		Exams , reports, discussions
The fifth week	2Theoretic 3 Practica		The effect of water stress on: Metabolic components Morphological comparison between Plants exposed to stress And balanced plants		Exams , reports, discussions
the sixth week	2Theoretic 3 Practica		Divide plants according to their needs waterproof, Plants adapt to water stress Anatomical features The morphology of plants Drought resistance		Exams , reports, discussions
Seventh week	2Theoretic 3 Practica		Hardening, the effect of soil darkening the plants Practical experiments on hardening And the darkening of the soil		Exams , reports, discussions
The eighth week			First monthly exam		
Week nine	2Theoretic 3 Practica		Thermal stress Plant division and acclimatization for different temperatures Methods for measuring temperature in plants And soil, and the relationship between temperature		Exams , reports, discussions

The tenth week	2Theoretic 3 Practical		Low temperature stress Effect of low temperature str On physiological processes High temperature stress Scientific experiments on stro The heat		Exams , reports, discussions
Week eleven	2Theoretic 3 Practical		Salt stress (problem soil wavy, Causes of soil salinity, types Plants and their adaptation t stress Saline, effect of salt stress On plant anatomy, effect Salt stress during operations physiological(Scientific experiments on salinity- Anatomical and morphologic comparison Among plants exposed to salinity Plants growing in a different environment Salty		Exams , reports, discussions
The twelfth week	2Theoretic 3 Practical		External factors affecting On responding to stress Saline, stress number Hydroxychloroquine Salinity measurement method		Exams , reports, discussions
The thirteenth week	2Theoretic 3 Practical		Photostress Scientific experiments on stres Photosynthesis- anatomical comparison and morphology among plants Exposed to light stress And non-stressed plants		Exams , reports, discussions
The fourteenth week	2Theoretic 3 Practical		Pollutant stress Anatomical and morphologica comparison Among plants exposed to pollution And plants not exposed to pollution		Exams , reports, discussions
			The second monthly exam		

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)

Main references (sources)

Matthew, A.J and P. M. Hasegawa (2003).
Plant Abiotic Stress. 2nd Edition. Wily

صادر 2)

	Pub. PP: 336. Shabala S. (2017). Plant Stress Physiology. 2nd Edition. CABI Pub. PP: 376		
Recommended books and references (scientific journals, reports...)	Iraqi -reviewed journals /https://www.elsevier.com		
Electronic References, Websites	/https://www.elsevier.com /https://scholar.google.com		

Course Description Form

Course Name:
31- Geographic information systems
Course Code:
Semester / Year: Fourth
Description Preparation Date: 2023-2024
Available Attendance Forms: In person + electronic
Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 75 hours
Course administrator's name (mention all, if more than one name)
Name: assi. Prof. Dr. ali Fadhil Email: alifadhil@mu.edu.iq
Course Objectives
<p>General objectives: Introducing students to the general concepts of geographical technologies, a number of programs used, and introducing them to a number of concepts of the educational process and applications related to them.</p> <p>Specific objectives: The student should be able to:</p> <ol style="list-style-type: none"> 1. Knowledge of the basic foundations and principles of geographical techniques and their methods, tools and techniques. 2. Knowing the practical application process, its impact, and its relationship to the educational material. 3. Know the importance of geographic techniques in preparing digital maps. 4. Knowledge of the historical background for the development of geographical techniques and the scientific methods and methods associated with them. 5. Know the importance of geographical techniques in preparing agricultural research.

6. Applying the scientific concepts the student has learned in his practical life.
In addition to working on achieving the six levels (remembering - understanding - application - analysis - synthesis - evaluation).
In presenting the learning material by following multiple methods and methods.

Teaching and Learning Strategies

Strategy	<p>Strategic teaching and learning methods</p> <p>Audio methods (teaching explanation of the topic)</p> <p>Style of writing on the blackboard</p> <p>The method of direct dialogue between the teacher and the student, with student's evaluation in class participation</p> <p>Conduct experiments.</p>
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first week	2Theoretic 3 Practica		Introduction to geographi technologies (the concept technologies, the importance, types. complementary relations between geographi technologies)		Exams , reports, discussions
second week	2Theoretic 3 Practica		Remote sensing (understo (definition), its histor development. Its importa and areas of its gene applied uses.		Exams , reports, discussions
the third week	2Theoretic 3 Practica		Types of remote sensing and its techniques		Exams , reports, discussions
fourth week	2Theoretic 3 Practica		Google Earth applicati (definition, contents)		Exams , reports, discussions
The fifth week	2Theoretic 3 Practica		How to improve space visualization (bands, various operations on space visualization		Exams , reports, discussions

the sixth week	2Theoretic 3 Practical		Geographic Information Systems (GIS) (introduction to information systems, understanding (nature of currency), definition features)		Exams , reports, discussions
Seventh week	2Theoretic 3 Practical		Components of geographic information systems		Exams , reports, discussions
The eighth week			Types of data and information in geographic information systems (spatial data).		
Week nine	2Theoretic 3 Practical		Data Descriptive and temporal data		Exams , reports, discussions
The tenth week	2Theoretic 3 Practical		Databases in geographic information systems and their types		Exams , reports, discussions
Week eleven	2Theoretic 3 Practical		Structure and installation databases in geographic information systems		Exams , reports, discussions
The twelfth week	2Theoretic 3 Practical		A practical lesson on how to create databases in geographic information systems		Exams , reports, discussions
The thirteenth week	2Theoretic 3 Practical		Applications of Arc GIS 10.1 (definition, contents, (display window, tables, layout, scripts))		Exams , reports, discussions
The fourteenth week	2Theoretic 3 Practical		Working with the scene or display window (opening the project, zooming in and out of features, moving them, showing, hiding, arranging activating topics)		Exams , reports, discussions
			Dealing with the charts window (creating it, editing it, displaying it)		

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)

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

Course Description Form

Course Name:	
32- Professional ethics	
Course Code:	
Semester / Year:	
2023 – 2024	
Description Preparation Date:	
28 -2-2024	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
One hour per week on Semester	
Course administrator's name (mention all, if more than one name)	
Name: Prof.Dr.Falah Hasan Issa Email: flah70-hasan@mu.edu.iq	
Course Objectives	
Course Objectives	Creating a community prepared to deal with the la market <ul style="list-style-type: none"> • Knowledge of general work ethics • Knowledge of rights and duties at work
Teaching and Learning Strategies	
Strategy	

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- The concept of work ethics 2- The importance of ethics in general 3- The importance of ethics for the individual 4- The importance of ethics for society 5- Ethics required in the employer-employee relationship 6- The decline in work ethics 7- Patterns of behavior and ethics at work 8- Types of corruption according to the field in which it arose 9- Corruption according to the affiliation of the individuals involved in corruption 10- Manifestations of administrative and financial corruption 11- The ethics of the teaching profession and its impact on the educator's personality and performance 12- Sources of ethics in the teaching profession 13- The characteristics that should be present in the educator		
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)					
Main references (sources)			google		
Recommended books and references (scientific journals, reports...)			Reports		
Electronic References, Websites			Ethics		

Course Description Form

Course Name:
33- Water Quality
Course Code:

Semester / Year:					
Semester					
Description Preparation Date:					
27/2/2024					
Available Attendance Forms:					
Attend					
Number of Credit Hours (Total) / Number of Units (Total)					
4		3			
Course administrator's name (mention all, if more than one name)					
Name: Assistant Professor Dr. bashar mezher jader Email: bashar_mezher@mu.edu.iq					
Course Objectives					
Course Objectives		The course describes the concept of hydrology and the hydrological and hydrological cycle. scientific terms used in the field of water science are also discussed. In this course, the student learns about the partial structure of water and natural and chemical properties. The flow of fluids in open pipes and channels in porous media is also explained and interpreted.			
Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> • Make the learner active and effective in educational situations. • Teach students to respect different opinions and value others • Benefit from other people's ideas and information. 			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

first	5	Water properties	Water quality	Explanation, presentation the model a lecture	Exam
the second	5	Irrigation water qual in Iraq	Water quality	Explanation, presentation the model a lecture	Exam
the third	5	Irrigation water classificatio systems	Water quality	Explanation, presentation the model a lecture	Exam
the fourth	5	Approved indicators evaluating irrigation water qual	Water quality	Explanation, presentation the model a lecture	Exam
Fifth	5	Suitability irrigation water	Water quality	Explanation, presentation the model a lecture	Exam
Sixth	5	Irrigation water qual	Water quality	Explanation, presentation the model a lecture	Exam
Seventh	5	The role irrigation water a salt balar in the soil	Water quality	Explanation, presentation the model a lecture	Exam
Eighth	5	Water Pollution	Water quality	Explanation, presentation the model a lecture	Exam
Ninth	5	Water desalinatio	Water quality	Explanation, presentation the model a lecture	Exam
Tenth	5	Water harvesting	Water quality	Explanation, presentation the model a lecture	Exam
Eleventh	5	The relationshi	Water quality	Explanation, presentation	Exam

		between irrigation water quality, agricultural yield, soil and climate		the model and lecture	
Twelfth	5	The relationship between irrigation water quality and irrigation technologies	Water quality	Explanation, presentation of the model and lecture	Exam
Thirteenth	5	Technologies for using surface water irrigation	Water quality	Explanation, presentation of the model and lecture	Exam
Fourteenth	5	Wastewater and techniques for its reuse in irrigation	Water quality	Explanation, presentation of the model and lecture	Exam

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)	Water quality
Main references (sources)	Books related to the subject and scientific research
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://wqa.org/

Course Description Form

Course Name:	
34- sustainable development	
Course Code:	
Semester / Year: Chapter Two/Four	
Description Preparation Date:	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 0 practical units 2	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Jaber Jassim Abu Talisha	
Email: Jaberalardy@mu.edu.iq	
Course Objectives	
Course Objectives	For the student to know the types of sustainable development • The student should classify

	<p>sustainable development and its benefits to the environment</p> <ul style="list-style-type: none"> • The student should detail the harms of environmental pollution • The student learns how to enhance the natural vital aspect • The student should evaluate the scientific reality to maintain a sustainable environment
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Teaching and Learning Strategies

Strategy	<ol style="list-style-type: none"> 1- Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The	5	The student gets to	Sustainable	Explanation,	the exam

first		know the ecosystems of sustainable	development	presentation of the model and lecture	
The second	6	agriculture is for the student to become familiar with the use of renewable resources	Sustainable development		
Third	5	The student learns about reducing toxic substances in the environment	Sustainable development	Explanation, presentation of the model and lecture	the exam
Fourth	5	The student gets to know soil conservation	Sustainable development	Explanation, presentation of the model and lecture	the exam
Fifth	5	: The student learns about water conservation	Sustainable development	Explanation, presentation of the model and lecture	the exam
Sixth	5	: The student learns about energy conservation	Sustainable development	Explanation, presentation of the model and lecture	the exam

Seventh	5	: The student gets to know the preservation of seeds and seeds	Sustainable development	Explanation, presentation of the model and lecture	the exam
Eighth	5:	The student gets to know capital in the sustainable agricultural system	Sustainable development	Explanation, presentation of the model and lecture	the exam
Ninth	5:	The student gets to know the management of the animal and plant ecosystem	Sustainable development	Explanation, presentation of the model and lecture	the exam
Tenth	\5	: The student will learn about enhancing and preserving natural life	Sustainable development	Explanation, presentation of the model and lecture	the exam
Eleventh	5	The student gets to know Recycling and preserving items	Sustainable development	Explanation, presentation of the model and lecture	the exam
Twelfth	5	The student gets to know the economics of			

		natural resources			
thirteenth	5	: The student knows how to manage human capital	Sustainable development	Explanation, presentation of the model and lecture	the exam
Fourteen	5	: The student gets to know sustainable agriculture	Sustainable development	Explanation, presentation of the model and lecture	the exam
Fifteenth	5	The student gets to know the types of sustainable natural energ	Sustainable development	Explanation, presentation of the model and lecture	the exam

Course Evaluation

- Theoretical tests 40
- 2- Practical tests -
- 3- Reports and studies 10
- 4- Final exam 50

Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals
Electronic References, Websites	Soil Science Society Of America Library Genesis

Course Description Form

Course Name:	
35- Basics of livestock production	
Course Code:	
Semester / Year: the second 2024	
Description Preparation Date: 2024/1/20	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total) 30(3 unit)	
Course administrator's name (mention all, if more than one name)	
Name: Hassan Awied Fazaa Email: hassanawied@mu.edu.iq	
Course Objectives	
Course Objectives	Identify the general economic aspects Identify the economic aspect of agricultural projects and calculating economic feasibility Analysis of cost and revenue items for the agricultural project Identify the role of the agricultural sector in the economic structure of the state
Teaching and Learning Strategies	
Strategy	
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first.	3		*Overview of livestock production	Theoretical lecture	Theoretical exam
second.	3		*Classification of ruminants		
third.	3		*Livestock producing milk and meat		
fourth.	3		*Sheep meat and wool		
Fifth.	3		*International and local types of goats		
six.	3		*Buffalo breeding		
Seventh.	3		*Camel breeding		
Eight.	3		*Some methods of raising camels		
Ninth.	3		*Farm animal nutrition		
tenth.	3		*Ruminant feeding		
eleventh	3		*Some types of buffalo in Iraq		

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)	*Principles of animal production *Basics of livestock production
Main references (sources)	-The basics of sheep and goat production, Dr. Jalal Elia Al-Qass 2- Milk cattle production, Dr. Naguib Tawfiq
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:					
36- Wind and water erosion					
Course Code:					
Semester / Year:					
Description Preparation Date:					
Available Attendance Forms:					
Number of Credit Hours (Total) / Number of Units (Total)					
Course administrator's name (mention all, if more than one name)					
Name: Dhafer Abdulrheem Shaker Email: : dhaferabdshaker@mu.edu.iq					
Course Objectives					
Course Objectives					
Teaching and Learning Strategies					
Strategy					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			Mechanics and processes of wind and water erosion Wind erosion Water erosion Erosion and its impact on human activities First month exam Runoff Soil erosion and its types Methods of controlling		

			soil erosion Environmental problems related to soil degradation The impact of soil maintenance on its sustainable productivity Second month exam The concept of non- erodible soil aggregates Sand dunes Windbreaks Small earth dams and water reservoirs		
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)					
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Course Description Form

Course Name:					
37- Groundwater management					
Course Code:					
Semester / Year:					
the first					
Description Preparation Date:					
1/9/2023					
Available Attendance Forms:					
Number of Credit Hours (Total) / Number of Units (Total)					
Course administrator's name (mention all, if more than one name)					
Name: Dhafer Abdulrheem Shaker Email: dhaferabdshaker@mu.edu.iq					
Course Objectives					
Course Objectives		<ul style="list-style-type: none"> • Identify the foundations of wind and water erosion. • Identify the impact of erosion on human activities. • Identify the danger of erosion on agricultural lands. • Compare and differentiate between wind erosion and water erosion. 			
Teaching and Learning Strategies					
Strategy					
Course Structure					
Week	Hours	Required Learning	Unit or subject name	Learning	Evaluation

		Outcomes		method	method
the first	2	Identify the impact of soil maintenance on its sustainable productivity	the impact of soil maintenance on its sustainable productivity	Attend	a daily test
the second	2	Identify the concept of non-erodible soil aggregates	the concept of non-erodible aggregates	Attend	a daily test
the third	2	Identify sand dunes	sand dunes	Attend	a daily test
the fourth	2	Identify windbreaks	windbreaks	Attend	a daily test
Fifth	2	Identify small earth dams and water reservoirs	small earth dams and water reservoirs	Attend	a daily test
VI	2	Identify erosion and weathering of groundwater	erosion and weathering of groundwater	Attend	a daily test
Seventh	2	Learn about the conservation and maintenance of soil and water	the conservation and maintenance of soil and water	Attend	a daily test
VIII	2	Identify wind erosion	wind erosion	Attend	a daily test
Ninth	2	Identify water erosion	water erosion	Attend	a daily test
The tenth	2	Identify erosion and its impact on human activities	erosion and its impact on human activities	Attend	a daily test
eleventh	2	Identify surface runoff	surface runoff	Attend	a daily test
twelfth	2	Identify soil erosion and its types	soil erosion and its types	Attend	a daily test
Thirteenth	2	Identify methods of controlling soil erosion	methods of controlling soil erosion	Attend	a daily test
fourteenth	2	Identify environmental problems related to soil degradation	environmental problems related to soil degradation	Attend	a daily test
Fifteenth	2	Identify the mechanics and process of wind and water erosion	the mechanics and process of wind and water erosion	Attend	a daily test
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)	
Main references (sources)	Water and wind erosion and its impact on lands. Written by: Dr. Dhafer Ibrahim Al-Azzawi, Dr. Ismail Fadel Al Bayati
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:	
38- English course	
Course Code:	
Semester / Year: Semester	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
2hours weekly	
Course administrator's name (mention all, if more than one name)	
Name: Lafta Awad Atshan Email: lafta.awad@mu.edu.iq	
Course Objectives	
Course Objectives	English language skills

Teaching and Learning Strategies					
Strategy					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Sentences strictures		
2	2		Past tense		
3	2		Past simple		
4	2		Past continuous		
5	2		Present tenses		
6	2		Present Simple		
7	2		Present continuous		
8	2		Future tense		
9	2		Future simple		
10	2		Paragraphs writing		
11	2		Paragraphs writing		
12	2		Paragraphs writing		
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)					
Main references (sources)			Cambridge English: Preliminary		
Recommended books and references (scientific journals, reports...)			Cambridge English: Preliminary		
Electronic References, Websites			An English videos		

Course Description Form

Course Name:	
39- Desert soil management	
Course Code:	
Semester / Year:	
23-2024	
Description Preparation Date:	
3/3/2024	
Available Attendance Forms:	
Attendance	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theory/ 4 practical / 3 units	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Saleh Shehab Sabah Email: saleh.sabah79@mu.edu.iq	
Course Objectives	
Course Objectives	<ul style="list-style-type: none"> Identify the types of oil soils How to deal with these soils Achieving maximum focus on the relationship of effective oil soils to growing crops in them Develop an agricultural plan that prevents accumulated climate damage and poor soil management Determine the location of the soil and the direction of the winds to place windbreaks and influence winds and floods
Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1- Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons in agricultural fields 5- Scientific trips to relevant departments and research stations 6- Self-learning method

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	6	Learn about desert soil management, definitions and terms	Related to soil management	Presence	Daily test
second	6	Identify the components of the desert environment	Components of the desert environment	Presence	Daily test
third	6	Learn about soil surveying and management	Soil surveying and management	Presence	Daily test
fourth	6	Learn about the mechanism of land use evaluation	The mechanism of land use evaluation	Presence	Daily test
Fifth	6	Identify the soil classification mechanism	Soil classification mechanism	Presence	Daily test
Sixth	6	Identify the suitability of soil for growing crops and vice versa	Suitability of soil for growing crops and vice versa	Presence	Daily test
Seventh	6	Learn about the agricultural cycle application	Learn about the agricultural cycle application	Presence	Daily test
Eighth	6	Get to know the administrative map	The administrative map	Presence	Daily test
Ninth	6	Identify the legal description of the land's location	The legal description of the land's location	Presence	Daily test
Tenth	6	Identify the Reclamation procedures	Reclamation procedures	Presence	Daily test
Eleventh	6	Identify civilian units	Civilian units	Presence	Daily test
Twelve	6	Learn about climate problems	Climate problems	Presence	Daily test

Thirteen	6	Identify the risks of erosion	The risks of erosion	Presence	Daily test
fourteen	6	Identify the most important desert plants	Most important desert plants	Presence	Daily test
Fifteen	6	Studying the effect of root systems on soil properties	Effect of root systems on soil properties	Presence	Daily test

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)	
Main references (sources)	Desert soil management lectures / College of Agriculture, Al-Muthanna University
Recommended books and references (scientific journals, reports...)	Al-Muthanna University Electronic Library
Electronic References, Websites	https://agr.mu.edu.iq

Course Description Form

Course Name:					
40– Soil survey and classification					
Course Code:					

Semester / Year:					
Fourd					
Description Preparation Date:					
26\2\2024					
Available Attendance Forms:					
Actual presence					
Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical		3 practical		units 3	
Course administrator's name (mention all, if more than one name)					
Name: aula saad rasool Email : aula.abokehella @mu.edu.iq					
Course Objectives					
Course Objecti		Soil classification systems in the world <ul style="list-style-type: none"> • The old system of soil classification • The modern quantitative system for soil classification • Rules and organizational structure 			
Teaching and Learning Strategies					
Strategy		1-Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method			
Course Structure					
Week	H	Required Learning Outcomes	Unit or	Learning	Evaluatio

	hours		subject name	method	assessment method
first	2	The student gets to know the concept of Classification	Soil survey classification	Explanation, presentation of model and lecture	the exam
the second	2	For the student to know the methods of Soil Classification	Soil survey classification	Explanation, presentation of model and lecture	the exam
the third	2	The student will be familiar with the means of Formation soil	Soil survey classification	Explanation, presentation of model and lecture	the exam
the fourth		The student will be familiar with the Soil survey	Soil survey classification	Explanation, presentation of model and lecture	the exam
Fifth	2	The student will be familiar with the conditions of soil formation	Soil survey classification	Explanation, presentation of model and lecture	the exam
Sixth	2	student gets to know the types Rocks	Soil survey classification	Explanation, presentation of model and lecture	the exam
Seventh	2	For the student to recognize the aspects the earth systems	Soil survey classification	Explanation, presentation of model and lecture	the exam
Eighth	2	The student will be familiar with the indicators for determining the effect of Geology	Soil survey classification	Explanation, presentation of model and lecture	the exam
Ninth	2	The student will be familiar with the means of increasing the ability of Field survey	Soil survey classification	Explanation, presentation of model and lecture	the exam
The tenth	2	The student will be familiar with the factors determining the quality of irrigation water and the indicators used to determine the quality of irrigation water	Soil survey classification	Explanation, presentation of model and lecture	the exam
Eleventh	2	The student will be familiar with irrigation water classification systems	Soil survey classification	Explanation, presentation of model and lecture	the exam
Twelfth	2	The student will learn Fao classification	Soil survey classification	Explanation, presentation of model and lecture	the exam
Thirteenth	2	For the student to become familiar with problems of limestone soils	Soil survey classification	Explanation, presentation of model and lecture	the exam
fourteenth	2	The student will be familiar with the	Soil survey	Explanation,	the exam

		means of increasing the ability of plants tolerate salinity	classification	presentation of model and lecture	
Course Evaluation					
1-Theoretical tests		25			
2- Practical tests		15			
3- Reports and studies		10			
4- Final exam		50			
Learning and Teaching Resources					
Required textbooks (curriculum books, if any)		11- soil classification dr. Ahmed ALmashedany			
Main references (sources)					
Recommended books and references (scientific journals, reports...)		Iraqi academic scientific journals			
Electronic Websites	Referenc	Soil Science Society Of America Library Genesis			