followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .AL-Muthanna

Faculty/Institute: ..Agriculture

Scientific Department: .....Soil and water resource

Academic or Professional Program Name: . Bachelor's

Final Certificate Name: . Bachelor of Science in Agriculture/Soil and Water Resources

Academic System: Semester system

Description Preparation Date: 1\9\2023

File Completion Date: 1\10\2023

Signature:

Head of Department Name:

Prof. Dr. Hanoun Nahi Kazem

Date: 1/10/2023

Signature:

Scientific Associate Name:

Prof. Dr. Abdullah Karim Jabbar

Date: 1/10/2023

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 11/3/2024

Signature:

Approval of the Dean

أ.م.د. حيدر حميد الكعبي
العميد

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

Academic Program and Course Description Guide

2024

Introduction:

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

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

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

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

Concepts and terminology:

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

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

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

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

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

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

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

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

1. Program Vision

The Department of Soil Sciences and Water Resources seeks to be one of the departments of advanced agricultural colleges in graduating competent agricultural engineers in the field of soil sciences and water resources to place them in the labor market and contribute to raising plant production by increasing soil fertility and improving its various qualities.

2. Program Mission

Leadership and excellence as a professional university that works to qualify and graduate national human resources with a high degree of competence for the labor market in the region. And to be a major source of applied scientific research that supports economic development and effective participation in social welfare.

3. Program Objectives

The program aims to prepare cadres of agricultural engineers specialized in the five soil sciences: soil chemistry, soil physics, soil biology, soil fertility, soil surveying and classification, and employ them in work in the local market and all state departments.

4. Program Accreditation

No

5. Other external influences

Ministry of Higher Education and Scientific Research

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	15	29	15.38	
College Requirements	19	62.5	33.15	
Department Requirements	30	97	51.45	
Summer Training	1			
Other				
The total	65	188.5		

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

1. Program Description

Year/Level	Course Code	Course Name	Credit Hours
First/ first semester	0C13101	Analytical chemistry	
	0C13102	General physics	
	U013101	Mathematics 1	
	0C13103	Engineering Drawing	
	U013102	Democracy and human rights	
	0C13104	Principles of animal production	
	0C13105	Principles of field crops	
	U013103	Computer 1	
First/ second semester	0023101	Geology	
	0C23101	Organic chemistry	
	0C23102	Principles of fruit production	
	0C23103	Space and leveling	
	U023101	Computer 2	
	U023102	English language	
	0C23104	Agriculture economy	
	U023103	Mathematics 2	
	U023104	Arabic language	
	U023105	Crimes of Ba'ath Party	
	0C13201	Biochemistry	

Second/ first semester	0013201	Principles of soil science	
	0C13202	Principles of statistics	
	0013202	Microbiology	
	0C13203	Vegetables production	
	U013201	Computer	
	0C13204	Agricultural machineries and equipment	
Second/ second semester	0023201	Soil, water, and plant analysis	
	0C23201	Basics of plant protection	
	0023202	Soil environment and Atmospheric extension	
	0C23202	Agricultural extension	
	0023203	Land settlement and adjustment	
	0C23203	Physiology	
	U023201	English language	
	U023202	Computer	
Third/ first semester	0013301	Soil physics	
	0013302	Soil chemistry	
	0013303	Soil fertility	
	0013304	Irrigation	
	0013305	Soil morphology	
	0C13301	Experimental Design and analysis	
	0013306	Soil and water pollution	
	U013301	English language	
Third/ second semester	0C23301	Economics of natural resources	
	0023301	Drainage	
	0023302	Soil mineralogy	
	0C23302	Remote Sensing	
	0023303	Soil salinity	
	0023304	Organic soil material	
Fourth/ first semester	0013401	Soil survey and classification	
	0013402	Soil and conservation	
	0013403	Soil microbiology	
	0013404	Plant nutrition	
	0013405	Hydrology	
	U013401	English language	
	0013406	Graduation research project	
	0013407	Irrigation systems technologies	
Fourth/ second semester	0023401	Fertilizer technologies	

	0023402	Land Reclamation	
	0023403	Soil management	
	0023404	Soil, water and plant relationship	
	0023405	Desertification	
	0023406	Graduation research project	
	0023407	Seminars	
	U023401	Sustainable development	
	U023402	Professional Ethics	

2. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
The second	0023202	Soil environment and atmospheric climate, theoretical and practical	2	3

3. Expected learning outcomes of the program

Knowledge	
The student should classify climate factors and their relationship to soil	The student should detail the benefits and harms of climatic factors such as temperature, wind, and frost
Skills	
Introducing the student to the concept of soil environment and weather conditions	The student's ability to distinguish between different environmental factors and their relationship to the soil
Enabling students to diagnose types of pollution and desertification	Empowering students to combat desertification and global warming
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

4. Teaching and Learning Strategies

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

5. Evaluation methods

1-Theoretical tests

2- Practical tests

3- Reports and studies

6. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Soil and water resources	Soil microbiology			2	
Professor	Soil and water resources	Soil fertility and fertilization			2	
Professor	Gardening	vegetable production			1	
Assistant Professor	Soil and water resources	Soil survey and classification			1	
Assistant Professor	agricultural economy	agricultural economy			1	
Assistant Professor	Plant/soil production	Soil chemistry			1	

Assistant Professor	Machine engineering	Agricultural machines			1	
Assistant Professor	Gardening	His saddle is green			1	
Lecturer	Soil and water resources	Soil fertility and fertilization			1	
Lecturer	Gardening	Heredity			1	
Lecturer	Vegetable production	Soil fertility			1	
assistant lecturer	Vegetable production	Soil physics			1	
assistant lecturer	Vegetable production	Soil microbiology			1	

Professional Development

Mentoring new faculty members

Guiding new, visiting, full-time and part-time faculty members by following them up by the Scientific Committee and the Department Head, attending lectures, and giving them the necessary directions.

Professional development of faculty members

1- Follow teaching and learning strategies

2- Evaluation of learning outcomes by the scientific committee

3- Professional development through holding development courses

7. Acceptance Criterion

Central admission

8. The most important sources of information about the program

1- The website of the college and university

2- University guide

3- Central Library

4- The most important books and sources for the department

5- The Internet

9. Program Development Plan

1-Teamwork: Working within the group effectively and actively.

2- Time management: Managing time effectively and setting priorities with the ability to work organized by appointments.

3- Leadership: The ability to direct and motivate others.

4- Independence at work.

5- Negotiation and persuasion (the student is able to influence and persuade others to discuss and reach an agreement.

6- Global skills (the student is able to speak and understand other languages and appreciate other cultures.

Program Skills Outline

				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
second	0023202	Soil environment and weather conditions	Basic	•	•	•	•	•	•	•	•	•	•	•	•

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

Course Description Form

1. Course Name:
Analytical Chemistry
2. Course Code:
0C13101
3. Semester / Year:
First Semester / First Year
4. Description Preparation Date:
28/2/2024
5. Available Attendance Forms:
Actual attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical / 2 practical / units 3
7. Course administrator's name (mention all, if more than one name)
Name: **Lecturer.** Anmar Hamoudi Kadhim Email: anmarjhayl@mu.edu.iq
8. Course Objectives

Course Objectives	**1- Introducing students to the concept of analytical chemistry, as it is one of the branches of chemistry, and what is its importance and types.** **2- Identify the methods of chemical analysis and the difference between one method and another.** **3- Learn how to conduct multiple methods of chemical analysis and what is the best way to obtain results.** **4- Learn about methods of calculation and data analysis to obtain results.** **5- Learn how to interpret the results and give the correct recommendations.**
9. Teaching and Learning Strategies	
Strategy	**1. Explain and clarify the concept of analytical chemistry.** **2. Explain the types of chemical analyzes and the differences between them.** **3. Learn about the use of chemical and mechanical methods and the use of devices to conduct analytical tests.** **4. Identify the characteristics of chemicals, their degree of danger, how to deal with them, and calculation methods.**

	5. Learn about computational methods to obtain chemical analysis results. **6. Interpretation of results.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	4	Definition of analytical chemistry and its importance	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
2nd	4	Classification of analytical chemistry	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
3rd	4	Types of analytical chemistry	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
4th	4	Analysis accounts Volumetric	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
5th	4	Types of calibrations used in volumetric analysis	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
6th	4	Learn about the concept of quivalence evidence and its theories	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
7th	4	Principles of gravimetric analysis and its requirements	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
8th	4	Gravimetric analysis methods	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
9th	4	Methods of deposition and isolation of materials	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
10th	4	Sediment contamination of materials and processing methods	Analytical Chemistry	Explanation and presentation Model and lecture	Examination
11th	4	Basic principles of spectroscopy	Analytical Chemistry	Explanation and presentation	Examination

				Model and lecture	

12th	**4**	**Spectral analysis devices and how to use them**	**Analytical Chemistry**	**Explanation and presentation Model and lecture**	**Examination**
13th	**4**	**Analysis using atomic absorption and emission**	**Analytical Chemistry**	**Explanation and presentation Model and lecture**	**Examination**
14th	**4**	**Atomic absorption devices, their types and methods of use**	**Analytical Chemistry**	**Explanation and presentation Model and lecture**	**Examination**
15th	**4**	**Practical application on spectroscopic and atomic analysis devices**	**Analytical Chemistry**	**Explanation and presentation Model and lecture**	**Examination**

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Foundations of analytical chemistry. Dr. Thabet Saeed Al-Ghabsha and Dr. Moyed Qasim Al-Abaji. Ministry of Higher Education and Scientific Research. University of Al Mosul.**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	**Iraqi academic scientific journals**
Electronic References, Websites	**https://learnchemistry12.com/2018/07/analytical-magdbook.html**

Course Description Form

1. Course Name:

General physics

2. Course Code:

0C13102

3. Semester / Year:

One/First
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Mohanad .T .Muften Email: mohanadturki@mu.edu.iq
8. Course Objectives

Course Objecti	**• General physics studies natural states of matter, general properties of matt and mechanical properties For the material.** **• It includes introducing the student to the assumptions of kinetic theory, molecular dimensions and interfacial distances.** **Brownian motion** **• Students learned about Boyle's law, compressibility and elasticity** **• The student learns about water: its molecular structure, its hydrogen bonding, and its properties as a solvent.** **• Study the concept of viscosity, Newton's law of viscosity** **• Identify optical devices, X-rays.**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	5	**The student gets to know the states natural matter, the general properties matter, and the mechanical properties matte**	General physics	**Explanation, presentation of model and lecture**	**the exam**

the secon	5	**The student will be familiar with assumptions of kinetic theory, molecu dimensions and interspace distances, a Brownian motion**	General physics	**Explanation, presentation of model and lecture**	**the exam**
the third	5	**The student gets to know molecu speeds, molecular forces, collisio between molecules, and therm properties of matter**	General physics	**Explanation, presentation of model and lecture**	**the exam**
the fourth	5	**The student gets to know Boyle's La compressibility and elasticity**	General physics	**Explanation, presentation of model and lecture**	**the exam**
Fifth	5	**The student gets to know mechanics: laws of force and motion, the laws motion in one dimension, and the free of bodies**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Sixth	5	**The student gets to know Newton's laws motion: the first law of motion, the seco law of motion, Newton's law of univer gravitation**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Seventh	5	**The student gets to know water: molecular structure, its hydrog bonding, and its properties as a solvent**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Eighth	5	**The student gets to know surface tensi contact angle, and capillary property**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Ninth	5	**The student will learn about diffusion a the osmotic phenomenon**	General physic	**Explanation, presentation of model and lecture**	**the exam**
The tenth	5	**The student will learn about viscos Newton's law of viscosity**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	5	**The student gets to know the flow of flu and fluid pressure**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	5	**The student will be familiar with volu and weight relationships, density objects, and porosity**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	5	**Surface area and quality**	General physic	**Explanation, presentation of model and lecture**	**the exam**
fourteent	5	**For the student to become familiar w optical devices**	General physic	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	5	**X ray**	General physic	**Explanation, presentation of model and lecture**	**the exam**

11. Course Evaluation

1-Theoretical tests	25
2- Practical tests	15
3- Reports and studies	10

4- Final exam	50
12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	Daniel Schaum: A series of Schaum's summaries of theories a problems in university physics
Main references (sources)	1- Principles of general physics _ Dr. Aqeel Mahdi Kazem 2- Dr. Rahim Abdelkatal: University Physics, Part 1, Mechan and Properties of Matter, Wave Motion, and Heat
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Internet**

Course Description Form

1. Course Name:	
Mathematic 1	
2. Course Code:	
U013101	
3. Semester / Year:	
First Semester / First Year	
4. Description Preparation Date:	
28/2/2024	
5. Available Attendance Forms:	
Actual attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 Theoretical / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: **Lecturer.** Anmar Hamoudi Kadhim Email: anmarjhayl@mu.edu.iq	
8. Course Objectives	
Course Objectives	**1- Possessing the skill of thinking and having the ability to find solutions using the correct laws and mathematical operations.** **2- Learn about methods of calculating**

	matrices and functions and their types. **3- Identify applications related to matrices and types of functions.** **4- Learn how to draw a function** **5- Using new mathematical methods to perform solutions.**

9. Teaching and Learning Strategies

Strategy	**1. Explaining and clarifying the mathematical concept and stating the laws related to it.** **2. Give some examples related to the topic.** **3. Involve students during the lecture in solving examples and problems using mathematical laws.** **4. Giving them homework and exercises related to the topic that was discussed in the lecture.** **5. Conduct daily tests for students in addition to monthly tests.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	Matrix	Mathematic 1	Explanation and presentation Model and lecture	Examination
2nd	2	Types of Matrix	Mathematic 1	Explanation and presentation Model and lecture	Examination
3rd	2	Computational methods use In solving matrices	Mathematic 1	Explanation and presentation Model and lecture	Examination
4th	2	Applications in solving functions and finding matrix inverses	Mathematic 1	Explanation and presentation Model and lecture	Examination
5th	2	Mathematical functions	Mathematic 1	Explanation and presentation Model and lecture	Examination
6th	2	Function components	Mathematic 1	Explanation and presentation Model and lecture	Examination
7th	2	Types of Mathematical function	Mathematic 1	Explanation and presentation Model and lecture	Examination

8th	**2**	**Differential relations used In the function**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
9th	**2**	**Higher ranks of Function**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
10th	**2**	**Partial derivatives**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
11th	**2**	**Function applications**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
12th	**2**	**Increasing, decreasing, and endings Great and small**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
13th	**2**	**Concavity and convexity curves in the function**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
14th	**2**	**Drawing functions**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**
15th	**2**	**Solved problems and examples of graphing the function**	**Mathematic 1**	**Explanation and presentation Model and lecture**	**Examination**

11. Course Evaluation

1-Theoretical tests 30
2- Daily tests 10
3- Homework 10
4- Final exam 50

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- **George B. Thomas, 2003. Calculus and Analytic Geometry.**
Main references (sources)	**1- Theories and problems in advanced calculus. 2008. Murray R. SPIEGEL. Eighth Arabic edition. International House for Cultural Investments. Egypt.** **2- 3000 solved problems in calculus. Elliot Mendelsohn. International**

	Academy. Beirut, Lebanon.
Recommended books and references (scientific journals, reports…)	**Iraqi academic scientific journals**
Electronic References, Websites	

Course Description Form

1. Course Name:
Engineering Drawing
2. Course Code:
0C13103
3. Semester / Year:
First semester / **First**
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
theoretical practical 2 units 1
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Dr. Ahmed Merza Abood Email :ahmedme@mu.edu.iq
8. Course Objectives

Course Objecti	**1- Teaching students, the basic concepts related to access to the simple basics of ar engineering drawing for students of the College of Agriculture.** **2- Development the ability of preparing engineering designs for agricultural projects,** **3- Student be able to read various engineering drawings and implement them in Reality.**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**The student gets to know the tools of engineering drawing and its uses.**	**1**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
the secon	2	**The student gets to know types of lines and dimensions**	**2**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the third	2	**The student gets to know the curves.**	**3**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the fourth	2	**Student able to recognize the ellipse**	**4**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Fifth	2	**Student able to recognize sections in engineering drawing**	**5**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Sixth	2	**The student will be familiar with the vertical projection of points, straight lines, and flat surfaces**	**6**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Seventh	2	**The student will be familiar with the vertical projection of points, straight lines, and flat surfaces**	**7**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and**

					activities in class
Eighth	2	student will know the complete sections	8	Explanation, presentation of model and lecture	The exam, Quizzes, Reports, and activities in class
Ninth	2	student will recognize the semi-section area	9	Explanation, presentation of model and lecture	the exam, Quizzes, Reports, and activities in class
Tenth	2	The student gets to know the sector parallel to the basic levels and its applications	10	Explanation, presentation of model and lecture	the exam, Quizzes, Reports, and activities in class
Eleventh	2	For the student to become familiar with exercises on the complete section and the semi-section	11	Explanation, presentation of model and lecture	The exam, Quizzes, Reports, and activities in class
Twelfth	2	Student becomes familiar with three-dimensional drawing and its conditions	12	Explanation, presentation of model and lecture	the exam, Quizzes, Reports, and activities in class
Thirteent	2	Student becomes familiar with the solid drawing of three-dimensional drawing.	13	Explanation, presentation of model and lecture	The exam, Quizzes, Reports, and activities in class
fourteent	2	student gets to know the isometric drawing.	14	Explanation, presentation of model and lecture	the exam, Quizzes, Reports, and activities in class
Fifteenth	2	Student becomes familiar with drawing parallel surfaces.	15	Explanation, presentation of model and lecture	The exam, Quizzes, Reports, and activities in class

11. Course Evaluation

1- Monthly tests 30
2- Daily tests 10
3- Daily duties and attendance 10

12. Learning and Teaching Resources

Required textbooks (curricu	Engineering drawing for students of the College of Agricultu

books, if any)	(Dr. Eng. Natiq Sabri - University of Mosul 1995)
Main references (sources)	Engineering drawing (Professor Abdul Rasul Al-Khafaf University of Technology 1990)
Recommended books and references (scientific journals, reports…)	Engineering drawing books for all engineering disciplines - Noor Library
Electronic Referenc Websites	**https://www.gulf-up.com/uz2pnxd1v0st**

1. Course Name:
human rights
2. Course Code:
U013102
3. Semester / Year: first
4. Description Preparation Date: 2023-2024
5. Available Attendance Forms: In person + electronic
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 30 hours
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Muhammad Radwan Mahmoud Email: modrn@mu.edu.iq
8. Course Objectives

	1The student's awareness of the historical development of human rights through explaining development and the various stages that occurred **It has passed through to the present time.** **2- Introducing the student to human rights in the heavenly religions and emphasizing the rol the Islamic religion that has been preserved** **These rights are distinct.** **3- Educating the Iraqi student about his civil, political, economic, social and cultural rights.** **4 - The student will learn about the role of the United Nations and its beginnings in suppor and shaping the principles of human rights** **Then its development and the establishment of various human rights organizations.** **5- That the student will be able to know the rights and freedoms stipulated in the I**

	Constitutio Course Objectives **n of 2005** **6- That the student is able to defend his rights after possessing a culture of human rights.**

9. 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**

10. Course Structure

Course Description Form

13. Course Name:

Principles of animal production

14. Course Code:

0C13104

15. Semester /

Year: the first 2024

16. Description Preparation Date

:2024/1/18

17.Available Attendance Forms:

18.Number of Credit Hours (Total) / Number of Units (Total) 30(3 unit)

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

Name: Hassan Awied Fazaa
Email: hassanawied@mu.edu.iq

20. Course Objectives

Course Objectives	• **Identify the general economic aspects** • **Identify the economic aspect of agricultural projects and calcula economic feasibility** • **Analysis of cost and revenue items for the agricultural project** • **Identify the role of the agricultural sector in the economic structure of state**

21. Teaching and Learning Strategies

Strategy	

22. 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		* Poultry classification		
Eight.	3		* Some methods of raising fish		
Ninth.	3		*Farm animal nutrition		
tenth.	3		Fish feeding*		
eleventh	3		* Some types of fish in Iraq		

23. 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

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	* Principles of animal production * principles of fish farming
Main references (sources)	1-The basics of sheep and goat production, Dr. Jal Elia Al-Qass 2-Fish farming, Dr. Qamar Al-Daham 3- Milk cattle production, Dr. Naguib Tawfiq
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Basics of field crops
2. Course Code:
0C13105
3. Semester / Year:

First

4. Description Preparation Date:

25\2\2024

5. Available Attendance Forms: In person + electronic

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

Number of Credit Hours (Total) 75 hours

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

Name: Prof. Dr. Shaimaa Ibrahim Mahmood AL Refai
Email: Shaimaaibrahim@mu.edu.iq

8. Course Objectives

Course Objectives **• Strengthening efforts aimed at using and prop managing water resources.** **• Develop a future vision for developing w harvesting technologies to support water resource** **• Increasing the volume of irrigation water availa for agricultural use, by adding dams, ta irrigation canals, and drilling wells, in additio development projects in this field and water su projects.**	**1- The course examines the identification of the m important grain crops in Iraq and the world** **2-It includes studying the scientific methods used growing grain crops** **3 -Study the appropriate environmental conditions growing each important field crop** **4- Defining the most important ways to incre productivity for each field crop** **5-Study the problems related to pests and diseases each field crop**

9. 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.**

10. Course Structure

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation method

		Outcomes			
The first week	**2Theoretical 3 Practical**		Field crops: their definition, Its development, its creators		**Exams , reports, discussions Quizzes**
second week	**2Theoretical 3 Practical**		Environmental factors in Iraq and in The world and its relationship to crop growth Field, location and surface, climate Soil, water resources		**Exams , reports, discussions**
the third week	**2Theoretical 3 Practical**		division of field crops, According to the life cycle		**Exams , reports, discussions**
fourth week	**2Theoretical 3 Practical**		Temperature, factors affecting Heat, temperature relationship With crops, crop adaptation To reduce the effect of temperatures And temperature damage		**Exams , reports, discussions**
The fifth week	**2Theoretical 3 Practical**		For light, the importance of light for plants, Adaptation of plants to light, importance Light in seed germination		**Exams , reports, discussions**
the sixth week	**2Theoretical 3 Practical**		**First monthly exam**		**Exams , reports, discussions**
Seventh week	**2Theoretical 3 Practical**		Water, water in the soil and its extent Crops benefit from it, balance internal water of the plant, Water consumption, efficient Water use, effect of water deficiency On crops, drought damage		**Exams , reports, discussions**
The eighth week	**2Theoretical 3 Practical**		Soil, soil texture, composition Soil, soil components, matter Soil organics, soil water, Soil air, harmful effect Soil salts on crops		
Week nine	**2Theoretical 3 Practical**		Air, air pollution, wind effect Crops, soil erosion by Crop winds		**Exams , reports, discussions**
The tenth week	**2Theoretical 3 Practical**		Mutual benefit, competition, opposition		**Exams , reports, discussions**
Week eleven	**2Theoretical 3 Practical**		Seeds and their importance, composition and maturity Seed dormancy, diagnosis Seed grading screening,		**Exams , reports, discussions**

			storage Seeds, marketing		
The twelfth week	**2Theoretical 3 Practical**		Weeds and ways to combat them		**Exams , reports, discussions**
The thirteenth week	**2Theoretical 3 Practical**		The updated one Agricultural courses		**Exams , reports, discussions**
The fourteenth week	**2Theoretical 3 Practical**		The updated one Breeding and improving field crops Major crops in the world And Iraq		**Exams , reports, discussions**
The fifteenth week			**The second monthly exam**		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of field crops Dr.. Majeed Mohsen Ansari Dr. Abdel Hamid Ahmed Al-Younis Dr.. Ghanem Saadallah Hasawi Dr. Wafqi Sha Al-Shamaa
Main references (sources)	From methodological books, help books, Internet, and scientific research
Recommended books and references (scientific journals, reports…)	Iraqi Scientific journals in basic specializations
Electronic References, Websites	Al-Muthanna University e-learning website https://agr.mu.edu.iq/

Course Description Form

13. Course Name:
Computer applications1
14. Course Code:
U013103
15. Semester / Year:
Second
16. Description Preparation Date:
3\7\2024

17.Available Attendance Forms:
Actual presence
18.Number of Credit Hours (Total) / Number of Units (Total)
2 /2
19. Course administrator's name (mention all, if more than one name)
Name: Dr. Karrar Hameed Abdulkareem Email: khak9784@mu.edu.iq
20. Course Objectives

Course Objecti	• The student gets to know Microsoft access in details. • The student should know advantages of using Microsoft access in real life. • The student should apply many commends and processes on Microsoft access.

21. Teaching and Learning Strategies	
Strategy	1-Explanation and clarification. 2- Practical lessons. 3- Self-learning method.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	Introduction to Microsoft access	Microsoft access	Explanation, presentation of model and lecture	Exam
second	2	Access main interface	Microsoft access	Explanation, presentation of model and lecture	Exam
third	2	Tabs and groups	Microsoft access	Explanation, presentation of model and lecture	Exam
fourth	2	Tabs and groups	Microsoft access	Explanation, presentation of model and lecture	Exam
Fifth	2	Tabs and groups	Microsoft access	Explanation, presentation of model and lecture	Exam
Sixth	2	Practical Example	Microsoft access	Practical session	Exam
Seventh	2	Practical Example	Microsoft access	Practical session	Exam
Eighth	2	Tables	Microsoft	Explanation,	Exam

			access	**presentation of model and lecture**	
Ninth	2	**Practical Example**	**Microsoft**	**Practical Example**	**Exam**
Tenth	2	**Queries**	**Microsoft access**	**Explanation, presentation of model and lecture**	**Exam**
Eleventh	2	**Practical Example**	**Microsoft access**	**Practical session**	**Exam**
Twelfth	2	**Reports**	**Microsoft access**	**Explanation, presentation of model and lecture**	**Exam**
Thirteent	2	**Control panel**	**Microsoft access**	**Explanation, presentation of model and lecture**	**Exam**
fourteent	2	**Practical Example**	**Microsoft access**	**Practical session**	**Exam**
Fifteenth	2	**Practical Example**	**Microsoft access**	**Practical session**	**Exam**

23. Course Evaluation

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

24. Learning and Teaching Resources

Required textbooks (curricu books, if any)	
Main references (sources)	1- Microsoft Access 2010 book(UNIVERSITY OF VIRGINIA HEALTH SYSTEM). 2- Lectures of Microsoft Access 2010 prepared by Eng.M.Abou Elale.
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	**https://support.microsoft.com/ar-sa/office/%D8%A7%D9%84%D9%85%D9%87%D8%A7%D9%85-%D8%A7%D9%84%D8%A3%D8%B3%D8%A7%D8%B3%D9%8A%D8%A9-%D9%81%D9%8A-access-2010-268acfed-2484-4822-acb3-c30e58045588**

Course Description Form

1. Course Name:
Geology
2. Course Code:
0023101
3. Semester / Year:
Fourd
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
7. Course administrator's name (mention all, if more than one name)
Name:As. ProfAhmed K.fazaa Email ahmad.kadem @mu.edu.iq
8. Course Objectives

Course Objecti	• **The student gets to know the classification and types of fertilizers and the importance** • **• For the student to learn about methods of adding fertilizers** • **• The student should separate the positive and negative aspects of fertilize and its harm to plants** • **• For the student to recognize pollution from chemical fertilizers** • **• The student should evaluate soil fertility** •

9. 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

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	2	**The student gets to know the concept of saline soils**	**Soil Salinity**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**For the student to know the sources of Soil**	Geology	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**The student will be familiar with the means of Formation soil**	Geology	**Explanation, presentation of model and lecture**	**the exam**
the fourth	2	**The student will be familiar with the Ro formation**	Geology	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student will be familiar with the conditions of soil formation**	Geology	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**student gets to know the types Rocks**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**For the student to recognize the aspects the earth systems**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**The student will be familiar with the indicators for determining the effect of Geology**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**The student will be familiar with the means of increasing the ability of Fiel Geology**	**Geology**	**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 determine the quality of irrigation wate**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	**The student will be familiar with irrigati water classification systems**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	2	**The student will learn Ground Water**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	2	**For the student to become familiar with problems of limestone soils**	**Geology**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**The student will be familiar with the means of increasing the ability of plants tolerate salinity**	**GEOLOGY**	**Explanation, presentation of model and lecture**	**the exam**

Fifteenth	2		**Soil Salinity**	**Explanation, presentation of model and lecture**	**the exam**

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

12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	11- geology Book.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

13. Course Name:
organic chemistry
14. Course Code:
OC23101
15. Semester / Year:
The first stage/spring semester
16. Description Preparation Date:
26/2/2024
17.Available Attendance Forms:
Presence
18.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours and 3 practical hours. Number of units: 3
19. Course administrator's name (mention all, if more than one name)

Name: Prof. Dr. Jassim Kassim Menati
Email: jasimiraqe@mu.edu.iq

20. Course Objectives

Course Objectives	• **1 Providing students with general informa about organic chemistry** • **2 Introducing students to alkanes** • **3 Introducing students to alkenes** • **4 Explanation of alkynes for students**

21. Teaching and Learning Strategies

Strategy	1 Explanation and clarification 2 Lecture method 3Student groups 4Practical lessons in laboratories

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Introduction to organic chemistry	A lecture	Quiz
2	2	Theoretical lecture	Alkanes	A lecture	Quiz
3	2	Theoretical lecture	Alkenes	A lecture	Quiz
4	2	Theoretical lecture	Alkynes	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Aliphatic cyclic compounds	A lecture	Quiz
7	2	Theoretical lecture	Formation of the aromatic ring - activity and direction - preparation – interactions	A lecture	Quiz
8	2	Theoretical lecture	Aromatic compounds	A lecture	Quiz
9	2	Theoretical lecture	Amines	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Aliphatic and aromatic halides	A lecture	Quiz

12	2	Theoretical lecture	Alcohols, phenols and ethers	A lecture	Quiz
13	2	Theoretical lecture	Aldehydes and ketones	A lecture	Quiz
14	2	Theoretical lecture	Carboxylic acids	A lecture	Quiz
15	2	Theoretical lecture	Derivatives of carboxylic acids	A lecture	Quiz

23. 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	
24. Learning and Teaching Resources	
Required textbooks (curricular books, if any	Organic chemistry Abdul-Alah Al-Abdo and Ali Sulaiman Yoss
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Journal of Organic Chemistry
Electronic References, Websites	https://publications.iupac.org/compendium/index.html

Course Description Form

25. Course Name:
Fruit production
26. Course Code:
OC23102
27. Semester / Year:
Two/First
28. Description Preparation Date:
26\2\2024
29.Available Attendance Forms:
Actual presence
30.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
31. Course administrator's name (mention all, if more than one name)
Name: Dr. Mohanad .T .Muften Email: mohanadturki@mu.edu.iq

32. Course Objectives

Course Objecti	**• Enable students to distinguish between types of fruits according to their ar of growth and distribution** **• Enabling students to identify the most important types of fruits that fruit plants have** **• Introducing the student to the concept of floatation, types of flowers, and th relationship to pollination and parthenogenetic fruiting in plants** **• Introducing the student to vaccination and installation, the dates for performing it, the principles, and why we resort to vaccination and installati according to the principles**

33. 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

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	5	**Nutritional and economic importance**	Fruit production	**Explanation, presentation of model and lecture**	**the exam**
the secon	5	**Factors affecting fruit trees**	Fruit production	**Explanation, presentation of model and lecture**	**the exam**
the third	5	**Division of fruit trees**	Fruit production	**Explanation, presentation of model and lecture**	**the exam**
the fourth	5	**Care, storage and marketing of fruit fr fruit trees**	Fruit production	**Explanation, presentation of model and lecture**	**the exam**
Fifth	5	**Fruit softening and its role in improv their properties**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Sixth	5	**Multiplication of fruit trees**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Seventh	5	**Vegetative propagation of fruit trees**	Fruit productio	**Explanation, presentation of**	**the exam**

				model and lecture	
Eighth	5	**Create orchids**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Ninth	5	**Apples / pears – apples**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
The tenth	5	**Stone stones / apricots – peaches**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	5	**Pomegranate**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	5	**The Fig**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	5	**Olive**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
fourteent	5	**Date palm**	Fruit productio	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	5	**The grape**	**Fruit producti**	**Explanation, presentation of model and lecture**	**the exam**

35. Course Evaluation

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

36. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Faslja Fruit Trees\Hassan Jundia - Evergreen Fruit\Makki Alw Al-Khafaji, Suhail Aliwi Atrah, and Alaa Abdel-Razzaq
Main references (sources)	Fruit production for departments not specialized in horticultu - Dr. Ali Hussein Abdullah Al-Douri / Dr. Adel Khader Saeed Raw
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Internet**

Course Description Form

37. Course Name:
Surveying
38. Course Code:
OC23103
39. Semester / Year: 2023-2024
40. Description Preparation Date:1-9-2023
41.Available Attendance Forms: Attended
42.Number of Credit Hours (60) / Number of Units (3)
43. Course administrator's name (mention all, if more than one name)
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq

44. Course Objectives	
Course Objectives	• to determine, measure and represent land, three-dimensional objects, point- fields and trajectories; • to assemble and interpret land and geographically related information, • to use that information for the plannin and efficient administration of the lan the sea and any structures thereon; an • to conduct research into the above practices and to develop them

45. Teaching and Learning Strategies	
Strategy	1-Explaining the importance of using space and training students to benefit from agricultural aspect 2- Explaining the modern and advanced method in agriculture of finding points of high a low and thus leveling agricultural lands

46. Course Structure

Week	Hours	Required Learning	Unit or	Learning	Evaluation

		Outcomes	subject name	method	method
1	4	Definition of the surveying, the types of surveys, the requirements of a good survey and its the importance in agriculture		Theoretical + practical lecture	test
2	4	Tape measurement- conditions for selecting stations- field book arrangement		Theoretical + practical lecture	test
3	4	Measurement systems		Theoretical + practical lecture	test
4	4	Mistakes& Errors in serving		Theoretical + practical lecture	test
5	4	Drawing scale		Theoretical + practical lecture	test
6	4	Areas-regular & irregular shapes		Theoretical + practical lecture	test
7	4	Leveling terminology , types of adjustment, uses of the leveling device		Theoretical + practical lecture	test
8	4	Types of levelling , the phenomena of curvature and fracture and their treatment.		Theoretical + practical lecture	test
9	4	Methods of calculating point levels and elevation difference- direct and indirect		Theoretical + practical lecture	test
10	4	Making longitudinal sections		Theoretical + practical lecture	test
11	4	Calculating point levels , measuring distances ,drawing them on graph paper		Theoretical + practical lecture	test
12	4	Calculating the areas and volumes		Theoretical + practical lecture	test
13	4	Topographic maps		Theoretical + practical lecture	test
14	4	Contour lines		Theoretical + practical lecture	test
15	4	Theodolite device		Theoretical + practical lecture	test

47. 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	
48. 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

49. Course Name:
Computer fundamentals
50. Course Code:
U023101
51. Semester / Year:
First
52. Description Preparation Date:
29\2\2024
53.Available Attendance Forms:
Actual presence
54.Number of Credit Hours (Total) / Number of Units (Total)
2 /2
55. Course administrator's name (mention all, if more than one name)
Name: Dr. Karrar Hameed Abdulkareem Email: khak9784@mu.edu.iq

56. Course Objectives	
Course Objecti	• **The student gets to know computer fundamentals in details.** • **The student should know advantages of using computer device and main parts of t device in real life.** • **The student should apply many commends and processes on windows 7.**

57. Teaching and Learning Strategies	
Strategy	1-Explanation and clarification. 2- Practical lessons. 3- Self-learning method.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**Introduction to Computer Fundamentals and computer generations**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
second	2	**Abilities and uses of computer Device**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
Third	2	**Computer parts**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
fourth	2	**Computer parts**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**Computer parts**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**Practical Example**	**Computer Fundamentals**	**Practical session**	**the exam**
Seventh	2	**Practical Example**	**Computer Fundamentals**	**Practical session**	**the exam**
Eighth	2	**Introduction to windows 7**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**User interface and relative processes**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
Tenth	2	**Computer components (partitions, folders, and files)**	**Computer Fundamentals**	**Practical session**	**the exam**
Eleventh	2	**Practical Example**	**Computer Fundamentals**	**Practical session**	**the exam**
Twelfth	2	**Start menu and taskbar**	**Computer Fundamentals**	**Explanation, presentation of**	**the exam**

				model and lecture	
Thirteent	2	**Control panel**	**Computer Fundamentals**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**Practical Example**	**Computer Fundamentals**	**Practical session**	**the exam**
Fifteenth	2	**Practical Example**	**Computer Fundamentals**	**Practical session**	**the exam**

59. Course Evaluation

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

60. Learning and Teaching Resources

Required textbooks (curricu books, if any)	
Main references (sources)	3- Basic Computer course book(Free University of Bolzano Bozen – Dr. Paolo Coletti - Edition 8.0 (1 March 2016)). 4- مقدمة عن الحاسب الالي اعداد احمد محمد ابراهيم.
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	

Course Description Form

1. Course Name:

English Language

2. Course Code:

U023102

3. Semester / Year:

/ **The first**

4. Description Preparation Date:

26\2\2024

5. Available Attendance Forms:

Actual presence

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

theoretical 2 practical units 1

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

Name: Assistant Professor Dr. Ahmed Merza Abood
Email :ahmedme@mu.edu.iq

8. Course Objectives

Course Objecti	**- Teaching students, the basic concepts related to access to the simple basics of introduction to the English language for students of the College of Agriculture.** **- The student gets to know the concept of the English language.** **- Enabling students to know how to deal with the English language**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**Hello:** **- (am/is/are, your,my)** **- This is** **- How are you?** **- Good morning** **- What's this in English?** **- Numbers 1-10, Plurals**	**1**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
the secon	2	**Your world:** **- Countries** **-He/she/they, his/her** **-Where's he from?** **- Fantastic/awful/beautiful**	**2**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

		- Numbers 11-30			
the third	2	**All about you:** **- Jobs** **- am/are/is** **- Negatives and questions** **- Personal information** **- Social expressions**	**3**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the fourth	2	**Family and friends:** **- Our/their** **- Possessive's** **- The family** **- has/have** **- The alphabet**	**4**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Fifth	2	**The way I live:** **- Sports/food/drinks** **-Present simple-I/you/we/they** **- a/an** **- Languages and nationalities** **- Numbers and prices**	**5**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Sixth	2	**Every day:** **- The time** **- Present simple-he/she** **- Always/sometimes/never** **- Words that go together** **- Days of the week**	**6**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Seventh	2	**My favourites:** **- Questions words** **- Me/him/us/them** **- This /that** **- Adjectives** **- Can I …?**	**7**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eighth	2	**Where I live:** **- Rooms and furniture** **- There is/are** **- Prepositions** **- Directions**	**8**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Ninth	2	**Times past:** **- Saying years** **- Was/where born** **- Past simple-irregular verbs** **- Have/do/go** **- When's your birthday**	**9**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Tenth	2	**We had a great time:** **- Past simple-regular and irregular** **- Questions and negatives** **- Sport and leisure** **- Going sightseeing**	**10**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eleventh	2	**I can do that:** **- Can/can't** **- Adverbs** **- Adjective** **- Noun** **- Everyday problems**	**11**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

Twelfth	2	**Please and thank you:** **- I'd like-some/any** **- In a restaurant** **- Signs all around**	**12**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Thirteent	2	**Here and now:** **- Colours and clothes** **- Present continuous** **- Opposite verbs** **- What's the matter?**	**13**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
fourteent	2	**It's time to go:** **- Future plans** **- Grammar revision** **- Vocabulary revision** **- Social expressions**	**14**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Fifteenth	2	**Reviewing**	**15**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

11. Course Evaluation

1-Theoretical tests	35
2- Quizzes, Reports, and Class's Activities	15
4- Final exam	50

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Beginner Student's Book: New Headway Plus (John and Soars) Oxford University Press
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	**Internet network**

Course Description Form

1. Course Name:
Principles of agricultural economics
2. Course Code:
OC23104

3. Semester / Year:

4. Description Preparation Date:

5. Available Attendance Forms:

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

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

Name: sadeq Hadi Hussein

Email: Sadeq.hadi@mu.edu.iq

8. Course Objectives

Course Objectives	- Active participation in the classroom - Submit assignments from last week - Weekly participation

9. Teaching and Learning Strategies

Strategy	1- Interest and knowledge of agricultural economics 2- Defining the difference between general economics and agricultural economics 3- Teaching students about the role of agricultural economics in supporting the economic development of the country

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- Introduction to agricultural economics		

			2- The concept of the production function 3- Diminishing returns and production stages 4- Demand, law of demand, factors affecting demand 5- Price elasticity of demand 6- Supply, the law of supply, factors affecting supply 7- Price elasticity of supply 8- Price and equilibrium price 9- Production costs 10- Agricultural prices 11- Economic derivatives of cost functions 12- Ways to reduce costs The principle of marginal returns Opportunity cost principle		

11. Course Evaluation	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Agricultural Economics - Abdul Wahab Matar Al-Dahri Economic Theory - Ahmed Zubair Geata The Economics of Agricultural Production - David Debreton - Translated by Salem Younis Al-Naimi
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Mathematic 2
2. Course Code:
U023103
3. Semester / Year:
First Semester / First Year
4. Description Preparation Date:
28/2/2024
5. Available Attendance Forms:
Actual attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
2 Theoretical / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: **Lecturer.** Anmar Hamoudi Kadhim Email: anmarjhayl@mu.edu.iq

8. Course Objectives

Course Objectives	**1- Possessing the skill of thinking and having the ability to find solutions using the correct laws and mathematical operations.** **2- Learn about methods of calculating matrices and functions and their types.** **3- Identify applications related to matrices and types of functions.** **4- Learn how to draw a function** **5- Using new mathematical methods to perform solutions.**

9. Teaching and Learning Strategies

Strategy	**1. Explaining and clarifying the mathematical concept and stating the laws related to it.** **2. Give some examples related to the topic.** **3. Involve students during the lecture in solving examples and problems using mathematical laws.** **4. Giving them homework and exercises related to the topic that was discussed in the lecture.** **5. Conduct daily tests for students in addition to monthly tests.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	Cardinal functions and integration	Mathematic 1	Explanation and presentation Model and lecture	Examination
2nd	2	Laws of indefinite integration for algebraic functions	Mathematic 1	Explanation and presentation Model and lecture	Examination
3rd	2	Laws of indefinite integration for trigonometric functions	Mathematic 1	Explanation and presentation Model and lecture	Examination
4th	2	Laws of indefinite integration for exponential functions	Mathematic 1	Explanation and presentation Model and lecture	Examination
5th	2	Retail integration	Mathematic 1	Explanation and presentation Model and lecture	Examination
6th	2	Definite integral and	Mathematic 1	Explanation and	Examination

		its basic theorem		presentation Model and lecture	
7th	2	Calculate the area under the curve of a function using definite integration	Mathematic 1	Explanation and presentation Model and lecture	Examination
8th	2	The concept of the purpose of the function	Mathematic 1	Explanation and presentation Model and lecture	Examination
9th	2	Definitions of the purpose of the function and its theorems	Mathematic 1	Explanation and presentation Model and lecture	Examination
10th	2	The continuity of the function at a given point	Mathematic 1	Explanation and presentation Model and lecture	Examination
11th	2	Some theorems of continuity	Mathematic 1	Explanation and presentation Model and lecture	Examination

12th	2	Algebraic operations on continuous functions	Mathematic 1	Explanation and presentation Model and lecture	Examination
13th	2	Continuity at a number And continuity in the field	Mathematic 1	Explanation and presentation Model and lecture	Examination
14th	2	Continuous functions and solving equations	Mathematic 1	Explanation and presentation Model and lecture	Examination
15th	2	Solved problems and examples of continuity	Mathematic 1	Explanation and presentation Model and lecture	Examination

11. Course Evaluation

1-Theoretical tests 30
2- Daily tests 10
3- Homework 10
4- Final exam 50

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- **George B. Thomas, 2003. Calculus and Analytic Geometry.**
Main references (sources)	**1- Theories and problems in advanced calculus. 2008. Murray R. SPIEGEL. Eighth Arabic edition. International House for Cultural Investments. Egypt.** **2- 3000 solved problems in calculus. Elliot Mendelsohn. International Academy. Beirut, Lebanon.** **3- Dr. Ahmed Abdel-Aali. " Calculus " . The second part. 2003. New Book Publishing House.**
Recommended books and references (scientific journals, reports…)	**Iraqi academic scientific journals**
Electronic References, Websites	

Course Description Form

25. Course Name:	
Arabic Language	
26. Course Code:	
U023104	
27. Semester / Year:	
The first stage/spring semester	
28. Description Preparation Date:	
26/2/2024	
29.Available Attendance Forms:	
Presence	
30.Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours Number of units: 2	
31. Course administrator's name (mention all, if more than one name)	
Name: Email	
32. Course Objectives	
Course Objectives	• **Teaching the student grammar and parsing, as well as rhetoric in the Holy Quran.**

33. Teaching and Learning Strategies	
Strategy	1 Explanation and clarification 2 Lecture method 3Student groups 4Practical lessons in laboratories

34. 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

35. 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

36. 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

1. Course Name:
Agricultural extension
2. Course Code:
0C23202
3. Semester / Year:
Second semester / The second
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
theoretical 2 practical units 2
7. Course administrator's name (mention all, if more than one name)
Name: Assistant prof. Mustafa Abd Manshood Email :**mustafa.manshood@mu.edu.iq**
8. Course Objectives

Course Objecti	**- Teaching students, the basic concepts related to access to the simple basics of introduction to the English language for students of the College of Agriculture.** **- The student gets to know the concept of the English language.** **- Enabling students to know how to deal with the English language**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2		**About agricultural extension**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
the secon	2		**Types of extension training**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the third	2		**Contact method**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the fourth	2		**Creation and spread of modern innovations**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Fifth	2		**Leadership**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Sixth	2		**Planning extension programs**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Seventh	2		**Agricultural extension methods and extension methods**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and**

					activities in class
Eighth	2		**Agricultural extension philosophy**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Ninth	2		**Education and teaching**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Tenth	2		**The importance of using modern irrigation methods and their economic impacts**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eleventh	2		**The role of agricultural extension in improving archaeological areas**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Twelfth	2		**Water crisis**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Thirteent	2			**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
fourteent	2			**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Fifteenth	2			**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

11. Course Evaluation

1-Theoretical tests, Quizzes, Reports, and Class's Activities	50
4- Final exam	50

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Principles of agricultural extension - Abdullah Al-Samarrai

Main references (sources)	1-Planning extension programs 1992 - Abdullah Al-Samarrai 2- Agricultural Extension Science 1990- Adnan Hussein Al-Ja
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	**Internet network**

Course Description Form

37. Course Name:	
Applications in computers 1	
38. Course Code:	
U013201	
39. Semester / Year:	
First	
40. Description Preparation Date:	
7\3\2024	
41.Available Attendance Forms:	
Actual presence	
42.Number of Credit Hours (Total) / Number of Units (Total)	
2 /2	
43. Course administrator's name (mention all, if more than one name)	
Name: Dr. Karrar Hameed Abdulkareem Email: khak9784@mu.edu.iq	
44. Course Objectives	
Course Objecti	• **The student gets to know Microsoft PowerPoint** • **The student should know advantages of Microsoft PowerPoint in real life.** • **The student should apply many examples that relative to agriculture sector as well as other sectors.**
45. Teaching and Learning Strategies	
Strategy	1-Explanation and clarification. 2- Practical lessons. 3- Self-learning method.

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	Introduction to Micros PowerPoint	Microsoft PowerPoint	Explanation, presentation of model and lecture	Exam
Second	2	Tabs and groups	Microsoft PowerPoint	Explanation, presentation of model and lecture	Exam
Third	2	Tabs and groups	Microsoft PowerPoint	Explanation, presentation of model and lecture	Exam
Fourth	2	Practical Example	Microsoft PowerPoint	Practical session	Exam
Fifth	2	Practical Example	Microsoft PowerPoin	Practical session	Exam
Sixth	2	Tables	Microsoft PowerPoin	Explanation, presentation of model and lecture	Exam
Seventh	2	Deals with movies	Microsoft PowerPoin	Explanation, presentation of model and lecture	Exam
Eighth	2	Deals with movies	Microsoft PowerPoin	Explanation, presentation of model and lecture	Exam
Ninth	2	Shapes, smartart, and charts	Microsoft PowerPoin	Explanation, presentation of model and lecture	Exam
Tenth	2	Practical Example	Microsoft PowerPoin	Practical session	Exam
Eleventh	2	Practical Example	Microsoft PowerPoin	Practical session	Exam
Twelfth	2	Shapes, smartart, and charts	Microsoft PowerPoin	Explanation, presentation of model and lecture	Exam
Thirteent	2	Shapes, smartart, and charts	Microsoft PowerPoin	Explanation, presentation of model and lecture	Exam
fourteent	2	Practical Example	Microsoft PowerPoin	Practical session	Exam
Fifteenth	2	Practical Example	Microsoft PowerPoin	Practical session	Exam

47. Course Evaluation

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

48. Learning and Teaching Resources

Required textbooks (curricu books, if any)	
Main references (sources)	1- Microsoft Excel 2016 Step by Step 1st Edition by Curtis Frye 2- برنامج مايكروسوفت اكسل 2016 اعداد محمد مالك.
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	https://support.microsoft.com/en-gb/office/introduction-t excel-starter-601794a9-b73d-4d04-b2d4-eed4c40f98be

Course Description Form

1. Course Name:
Agricultural machinery and equipment
2. Course Code:
0C13204
3. Semester / Year: 2023-2024
4. Description Preparation Date:1-9-2023
5. Available Attendance Forms: Attended
6. Number of Credit Hours (60) / Number of Units (3)
7. Course administrator's name (mention all, if more than one name)
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq
8. 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

9. Teaching and Learning Strategies

Strategy	

10. 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	test

				lecture	
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

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	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

61. Course Name:	
Lands leveling and grading	
62. Course Code:	
0023203	
63. Semester / Year: 2023-2024	
64. Description Preparation Date:1-9-2023	
65.Available Attendance Forms: Attended	
66.Number of Credit Hours (60) / Number of Units (3)	
67. Course administrator's name (mention all, if more than one name)	
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq	
68. Course Objectives	
Course Objectives	• Increasing the production of agricultural crops in quantity and quality due to the distribution of water i the field at approximately one depth • Ease of irrigation, as the water is distributed evenly throughout the field. This means reducing the amou 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
69. Teaching and Learning Strategies	
Strategy	1- Create a slope that provides an appropriate amount of water 2- Leveling the field in the best way using the least possible amount of soil transpor for the purpose of leveling

70. 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 + practical lecture	test
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	test

				lecture	

71. 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

72. 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

1. Course Name:
Principles of statistics
2. Course Code:
0C13202
3. Semester / Year:
4. Description Preparation Date:
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: sadeq Hadi Hussein Email: Sadeq.hadi@mu.edu.iq

8. Course Objectives

Course Objectives	- Active participation in answering questions - Weekly assignments in order to practice applying the laws - Monthly tests

9. Teaching and Learning Strategies

Strategy	- Introducing students to the principles, basics, and applications of statistics - Teaching students the importance of knowing the statistical standards applied in agricultural research

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- A historical overview, definition, importance and applications of statistics 2- Introducing statistical terminology and methods for obtaining random samples 3- Tabular and graphical presentation 4- Concentration metrics 5- How to make a		

			frequency distribution table 6- Measures of relative dispersion 7- The relationship between the arithmetic mean, median, and mode 8- T-test and F-test 9- Simple regression 10- Correlation 11- Probability distributions 12- Normal distribution 13- Analysis of variance		

11. Course Evaluation

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction to Statistics - Khashi Muhammad Al-Rawi
Main references (sources)	Principles of Statistics - Ahmed Abdel Samie 2008
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Basis of microbiology
2. Course Code:
0013202
3. Semester / Year:
Semester
4. Description Preparation Date:
27/2/2024
5. Available Attendance Forms:
Attend
6. Number of Credit Hours (Total) / Number of Units (Total)
6 3
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Dr. Dhifaf jabbar shamran Email: dhifaf15@mu.edu.iq
8. Course Objectives

Course Objectives	*** Introducing the student to the nature of microbiology** *** Different types of microorganisms** *** The use of microorganisms in the agricultu field**

9. Teaching and Learning Strategies	
Strateg	- Cognitive objectives * 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 speci * Enabling the student to know the importance of microorganisms in the agricultural field B- Skills goals - Development of bacteria and fungi - Isolate and purify it - Testing its sensitivity to antibiotics

10. 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 o bacteria		
Forth			Fungi, their general characteris and types		
Fifth			Different metabolic activities o fungi and their classification		
Sixth			Monthly exam		
Seventh			Viruses, their definition, structu 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, structu and sections		
14			General Review		

15			Comprehensive exam		

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

12. Learning and Teaching Resources	
Required textbooks (curricular books, 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

13. Course Name:
Plant Physiology
14. Course Code:
0C23203
15. Semester / Year:
Second
16. Description Preparation Date:
26\2\2024
17.Available Attendance Forms:
Actual presence
18.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
19. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Falah Hasan Issa Email: flah70-hasan@mu.edu.iq
20. Course Objectives

Course Objecti	• **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** •

21. 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

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2		**Plant Physiology**	Components o plant cell	**the exam**
the secon	2		Plant Physiology	**Osmosis**	**the exam**
the third	2		Plant Physiology	Past and acti absorption	**the exam**
the fourth	2		Plant Physiology	Photosynthesis	**the exam**
Fifth	2		Plant Physiology	**Respiration**	**the exam**
Sixth	2		Plant Physiology	**Growth plant Hrmons**	**the exam**
Seventh	2		Plant Physiology	Inhibitors plant Hermo	**the exam**
Eighth	2		Plant Physiology	Enzymes	**the exam**
Ninth	2		Plant Physiology	**Transpiration**	**the exam**
The tenth	2		Plant Physiology	Guttation a blooding	**the exam**
Eleventh	2		Plant Physiology	**Colloidal solutions**	**the exam**
Twelfth	2		Plant Physiology	**Vernilazation**	**the exam**

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

24. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	1- Plant Physiology . 2000. Dr.Mouaid Alyonis
Main references (sources)	Plant Physiology
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Plant Physiology Journal** .

Course Description Form

25. Course Name:
Computer applications
26. Course Code:
U023202
27. Semester / Year:
Second
28. Description Preparation Date:
29\2\2024
29.Available Attendance Forms:
Actual presence
30.Number of Credit Hours (Total) / Number of Units (Total)
2 /2
31. Course administrator's name (mention all, if more than one name)
Name: Dr. Karrar Hameed Abdulkareem Email: khak9784@mu.edu.iq

32. Course Objectives

Course Objecti	• **The student gets to know Microsoft excel** • **The student should know advantages of Microsoft excel in real life.** • **The student should apply many examples that relative to agriculture sector as well as other sectors.**

33. Teaching and Learning Strategies

Strategy	1-Explanation and clarification. 2- Practical lessons. 3- Self-learning method.

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**Introduction to Microsoft Excel**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
second	2	**Tabs and groups**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
third	2	**Workbooks and sheets**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
fourth	2	**Practical Example**	**Microsoft Excel**	**Practical session**	**the exam**
Fifth	2	**Practical Example**	**Microsoft Excel**	**Practical session**	**the exam**
Sixth	2	**Workbooks design**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**Fundamentals of data entry**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**Fundamentals of data entry**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**Fundamentals of data entry**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
Tenth	2	**Practical Example**	**Microsoft Excel**	**Practical session**	**the exam**
Eleventh	2	**Practical Example**	**Microsoft Excel**	**Practical session**	**the exam**
Twelfth	2	**Tables**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**

Thirteent	2	**Charts**	**Microsoft Excel**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**Practical Example**	**Microsoft Excel**	**Practical session**	**the exam**
Fifteenth	2	**Practical Example**	**Microsoft Excel**	**Practical session**	**the exam**

35. Course Evaluation

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

36. Learning and Teaching Resources

Required textbooks (curricu books, if any)	
Main references (sources)	1- Microsoft Excel 2016 Step by Step 1st Edition by Curtis Frye 2- برنامج مايكروسوفت اكسل 2016 اعداد محمد مالك.
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	https://support.microsoft.com/en-gb/office/introduction-t excel-starter-601794a9-b73d-4d04-b2d4-eed4c40f98be

Course Description Form

37.Course Name:
Soil principles
38.Course Code:
0013201
Semester / Year: Chapter one / second
39.
40.Description Preparation Date:
41.Available Attendance Forms:
Actual presence
42.Number of Credit Hours (Total) / Number of Units (Total)

2 theoretical 0 practical units 2

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

Name: Prof. Dr. raheem alwan halool

Email: Rahim_alwan@mu.edu.iq

44.Course Objectives

The student gets to know soil science	• The student gets to know science • The student should clas the factors and processes soil formation • The student should sepa the various factors in formation of soil • For the student to learn ab how soil is formed developed • For the student to evaluate different types of soil

45.• The student should classify the factors and processes of soil formation

Strategy	1- Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first	5 5	The student will be familiar with an introduction to soil	Soil principles	Explanation, presentati	the exam

		science and the emergence and development of soils		on of the model and lecture	
The second	5 5	The student gets to know the types of factors and soil formation processes			
Third	5	The student gets to know the physical properties of soil	Soil principles	Explanation, presentation of the model and lecture	the exam
Fourth	5	The student gets to know the chemical properties of soil	Soil principles	Explanation, presentation of the model and lecture	the exam
Fifth	5	The student gets to know the biological characteristics	Soil principles	Explanation, presentation of the	the exam

		of soil		model and lecture	
Sixth	5	The student gets to know soil salinity	Soil principles	Explanation, presentation of the model and lecture	the exam
Seventh	5	The student will be familiar with the reclamation of saline soils	Soil principles	Explanation, presentation of the model and lecture	the exam
Eighth	5	The student gets to know the types of soil water	Soil principles	Explanation, presentation of the model and lecture	the exam
Ninth	5	The student gets to know soil colloids	Soil principles	Explanati on, presentati	the exam

				on of the model and lecture	
Tenth	5	The student will learn about the effect of humidity on plants	Soil principles	Explanation, presentation of the model and lecture	the exam
Eleventh Twelfth	5 5	The student gets to know soil fertility For the student to recognize the most important reasons for low soil productivity	Soil principles	Explanation, presentation of the model and lecture	the exam the exam
thirteenth	5	The student will know how to feed plants	Soil principles	Explanation, presentation of the model and lecture	the exam

Fourteenth	5	The student gets to know the classification of soils	Soil principles	Explanation, presentation of the model and lecture	the exam
Fifteenth	5	For the student to become familiar with educational administration	Sustainable development	Explanation, presentation of the model and lecture	the exam

47.Course Evaluation

Theoretical tests 40

2- Practical tests -

3- Reports and studies 10

4- Final exam 50

48.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

1. Course Name:
English Language
2. Course Code:
U023201
3. Semester / Year:
Second semester / **The second**
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
theoretical 2 practical units 1
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Dr. Ahmed Merza Abood Email :ahmedme@mu.edu.iq
8. Course Objectives

Course Objecti	**- Teaching students, the basic concepts related to access to the simple basics of introduction to the English language for students of the College of Agriculture.** **- The student gets to know the concept of the English language.** **- Enabling students to know how to deal with the English language**
9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**Getting to know you:** **- Tenses** **- Questions** **- Using a bilingual dictionary** **- Social expressions 1**	**1**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
the secon	2	**The way we live:** **- Present tenses** **- Have/have got** **- Collocation-daily life** **- Making conversation**	**2**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the third	2	**It all went wrong:** **- Past tenses** **- Word formation** **- Time expressions**	**3**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the fourth	2	**Let's go shopping:** **- Much/many** **- Some/any** **- A few, a little, a lot of** **- Articles** **- Shopping, prices**	**4**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Fifth	2	**What do you want to do?** **- Verb patterns 1** **- future forms** **- Hot verbs** **- How are you feel?**	**5**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Sixth	2	**Tell me! What's it like?** **- What …like?** **- Comparatives and superlatives** **- Synonyms and antonyms** **- Directions**	**6**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Seventh	2	**Fame:** **- Present perfect** **- For, since** **- Adverbs, word pairs** **- Short answers**	**7**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eighth	2	**Do's and don'ts:** **- Have(got) to** **- Should/must** **- Words that go together** **- At the doctor's**	**8**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

Ninth	2	**Going places:** **- Time clauses** **- If** **- Hot verbs** **- In a hotel**	**9**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Tenth	2	**Scared to death:** **- Verb patterns 2** **- Manage to, used to** **- Ed/ing adjectives** **- Exclamations**	**10**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eleventh	2	**Things that changed the world:** **- Passives** **- Verbs and nouns that go together** **- Notices**	**11**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Twelfth	2	**Dreams and reality:** **- Second conditional** **- Might** **- Phrasal verbs** **- Social expressions**	**12**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Thirteent	2	**Earning a living:** **- Present perfect continuous** **- Word formation** **- Adverbs** **- Telephoning**	**13**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
fourteent	2	**Family ties:** **- Past perfect** **- Reported statements** **- Saying goodbye**	**14**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Fifteenth	2	**Reviewing**	**15**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

11. Course Evaluation

1-Theoretical tests	35
2- Quizzes, Reports, and Class's Activities	15
4- Final exam	50

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Pre-Intermediate Student's Book: New Headway Plus (John a Liz Soars) Oxford University Press
Main references (sources)	
Recommended books and references (scientific	

journals, reports…)	
Electronic Referenc Websites	**Internet network**

Course Description Form

13. Course Name:	
Soil environment and weather conditions	
14. Course Code:	
0023202	
15. Semester / Year:	
Second	
16. Description Preparation Date:	
26\2\2024	
17.Available Attendance Forms:	
Actual presence	
18.Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
19. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Abdullah Karim Jabbar Email: karrm74@mu.edu.iq-llahabda	
20. Course Objectives	
Course Objecti	• **The student gets to know environmental science** • **The student should classify climate factors and their relationship to soil** • **The student should detail the benefits and harms of climatic factors such as temperature, wind, and frost** • **The student should know about pollution and its causes** • **The student will evaluate desertification and global warming**…..
21. 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

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**The student gets introduction to ecology and ecosystem**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**The student gets to know types of ecosystems and s factors**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**For the student to learn ab the importance of biologi water and the division of pla according to their need water, rain, and th effectiveness**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
the fourth	2	**The student gets to kn condensation and frost**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student gets to know temperature and thermal ra of plants and the effect of h stress**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**The student will be famil with the nature of therr stress, the effect of heat vegetation, thermal synchro and ambient temperature**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**The student gets to know li and the biological effects of lig**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**The student gets to know point of photocompensation a the effect of light on the sha and structure of plants**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**The student will be famil with humidity and the decre in the degree of saturation**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	2	**The student will learn about effect of humidity on plants**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	**For the student to get to know Winds, their types, harms a benefits to plants**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**

Twelfth	2	**The student gets to know most important contempor environmental issues**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	2	**The student will be famil with pollution and interrelated effects**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**The student will be famil with the phenomenon inverted gradient and glo warming**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	2	**The student gets to kn desertification, its types a causes**	**Soil environment weather conditions**	**Explanation, presentation of model and lecture**	**the exam**

23. Course Evaluation

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

24. Learning and Teaching Resources

Required textbooks (curricu books, if any)	1- Fundamentals of Agricultural Climatology. 2015. Salam H Ahmed Al-Jubouri. Amman. Jordan. 2- Plant ecology. 1989. Dr. Majeed Rashid Al-Hilli and Hikmat Abbas Al-Ani. Dar Al-Kutub for Printing and Publishi Iraq. University of Al Mosul.
Main references (sources)	Environment and problems of pollution. 2017. Muhamm Hassan Awad and Hassan Ahmed Shehata. Dar Taiba Publishing and Distribution. Cairo. Egypt.
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

73.Course Name
Soil, water and plant analysis
74.Course Code:
0023201
Semester / Year: Chapter Two/Four
75.

76.Description Preparation Date:
77.Available Attendance Forms:
Actual presence
78.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 0 practical units 2
79.Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. raheem alwan halool Email: **Rahim_alwan@mu.edu.iq**

80.Course Objectives	
Course Objectives	For the student to know the types of analytical methods • The student learns how to analysis water , soil and plant • The student should evaluate the scientific reality to maintain analytical methods •

81.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

82. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first	5 5	The student gets to know introduction about water , soil plant analytical	er , soil and plant analytical	Explanation, presentation of the model and lecture	the exam
The second	5 5	is for the student to know analytical of water			
Third	5	The student learns about soil analytical	Water , and p analytical	Explanation, presentation of the model and lecture	the exam

Fourth	5	The student gets to know plant analytical	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fifth	5	: The student learns about methods of soil samples	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
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	5	The student gets to know the quantitative and volumetric methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Ninth	5	The student gets to know the quantitative and weighing methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Tenth	5	: The student will learn about electrical of a Analytical methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Eleventh	5 5	The student gets to know About analytical of spectroscopy	Water , and p analytical	Explanation, presentation of the model and	the exam the exam

Twelfth		The student gets to know Atomic emission methods		lecture	
thirteenth	5	: The student knows how the Atomic absorption methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fourteenth	5	: The student gets to know Metal analysis methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fifteenth	5	The student gets to know the types of X-	Water , and p analytical	Explanation, presentati	the exam

		ray analysis methods		on of the model and lecture	

83.Course Evaluation
Theoretical tests 40 2- Practical tests - 3- Reports and studies 10 4- Final exam 50

84.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

85. Course Name:
Natural resource economics
86. Course Code:
0C23301
87. Semester / Year:
First \3
88. Description Preparation Date:
89.Available Attendance Forms:
90.Number of Credit Hours (Total) / Number of Units (Total)

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

Name: sadeq Hadi Hussein

Email: Sadeq.hadi@mu.edu.iq

92. Course Objectives

Course Objectives	-Active participation in the classroom -Rapid exams -Monthly tests are proof of understanding the lecture

93. Teaching and Learning Strategies

Strategy	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

94. 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		

95. Course Evaluation

Natural Resource Economics - Hassoun Muhammad Ali

96. 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 Title:
Design and analysis of agricultural experiments

Course Code	
0C13301	
Semester / Year	
Third / autumn	
The history of preparation of this description	
26/2/2024	
Available Attendance Forms	
Came	
Number of Credit Hours (Total) / Number of Units (Total)	
2 hours theoretical and 3 hours practical Number of units 3	
Course administrator's name (if more than one name)	
Name: A.M. Dr.Ragheb Hadi Ajami Email: rageb.hadi@mu.edu.iq	
Course Objectives	
* Introducing the student that there are areas that depend on conducting experiments and these experiments must be designed on scientific bases * When analyzing experiments, it is according to scientific methods and logical steps * When obtaining accurate results of the experiment leads us to make the appropriate decision * Introducing the student to many types of designs, as each experience has a specific design * Introduce the student to how to test the morale of each mathematical model * Introducing the student that there are tests conducted before the experiment and tests proposed after the experiment * Introducing the student that there are val that can be lost during the experiment and can estimated	Course Objectives:

Teaching and Learning Strategies					
Audio methods (teaching explanation of the subject) Blackboard writing style The method of direct dialogue between the teacher and the student with evaluation of the student in the classroom participations					Strategy
Course Structure					
Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	The week
Rapid exam	Lecture	A brief history of statistics, definition of statistics, division of statistics	Theoretical lecture	2	1
Rapid exam	Lecture	Measures of central tendency, measures of concentration	Theoretical lecture	2	2
Rapid exam	Lecture	Dispersion meters	Theoretical lecture	2	3
Rapid exam	Lecture	Hypothesis testing, statistical errors, hypothesis testing-t	Theoretical lecture	2	4
First month exam	Theoretical exam	examination	examination	2	5
Rapid exam	Lecture	Chi-Square Test	Theoretical lecture	2	6
Rapid exam	Lecture	general concepts and definitions in the design and analysis of experiments,	Theoretical lecture	2	7
Rapid exam	Lecture	Types of agricultural	Theoretical lecture	2	8

		experiments, complete random design			
Rapid exam	Lecture	LSD Test	Theoretical lecture	2	9
Second month exam	Theoretical exam	examination	examination	2	10
Rapid exam	Lecture	Design of complete random sectors	Theoretical lecture	2	11
Rapid exam	Lecture	Duncan Test	Theoretical lecture	2	12
Rapid exam	Lecture	Latin Square Design	Theoretical lecture	2	13
Rapid exam	Lecture	Factor experiments	Theoretical lecture	2	14
Rapid exam	Lecture	Factor experiments with two factors	Theoretical lecture	2	15

. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports …. etc	
. Learning and Teaching Resources	
1- Design and analysis of experiments - Kha Al-Rawi and Khalaf Allah 2000	Required textbooks (methodology any)
	Main references (sources)
- Foreign books specialized in the design agricultural experiments .	Recommended books and references (scientific journals, reports…)
Arabic articles issued by academic and professic bodies	Electronic References, Websites

Course Description Form

13. Course Name:

Soil fertility
14. Course Code:
0013303
15. Semester / Year:
Third
16. Description Preparation Date:
26\2\2024
17.Available Attendance Forms:
Actual presence
18.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
19. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Raheem alwan halool Email: Rahim_alwan@mu.edu.iq
20. Course Objectives

Course Objecti	• **The student gets to know the science of soil fertility** • **• The student should classify the types of elements and their importance t 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 their importance to plants**

21. 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

22. Course Structure

Week	Hou	Required Learning Outcomes	Unit	Learning method	Evaluation method

	rs		orsubjectname		
First	2	The student gets to know growth and the factors affecting it	**Fer er tech ogy**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	The student gets to know the types of nutrients	Fert er tech ogy	**Explanation, presentation of model and lecture**	**the exam**
the third	2	The student recognizes the movement and absorption of element the soil	Fert er tech ogy	**Explanation, presentation of model and lecture**	**the exam**
the fourth	2	The student gets to know the types of elements in the soil	Fert er tech ogy	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	The student gets to know the necessary elements	Fe zer tec olo	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	The student gets to know the major elements	**Fe ize tec olo**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	The student gets to know the smallest elements	**Fe ize tec olo**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	The student gets to know the useful and encouraging elements growth	**Fe ize tec olo**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	For the student to recognize the distinction between elements	**Fe ize tec olo**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	2	**For the student to get to know Factors affecting the readiness of elements**	**Fe ize tec olo**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	The student gets to know nitrogen and its factors	**Fe ize**	**Explanation,**	**the exam**

			tec olo	**presentation of model and lecture**	
Twelfth	2	The student gets to know phosphorus and potassium and their fac	Fe ize tec olo	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	2	The student gets to know sulfur, calcium, magnesium, and t elements	Fe ize tec olo	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**The student will be familiar with the evaluation of s fertility**	Fe ize tec olo	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	2	**The student will be familiar with the organic matter**	Fe ize tec olo	**Explanation, presentation of model and lecture**	**the exam**

23. Course Evaluation

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

24. Learning and Teaching Resources

Required textbooks (curricu 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-D Shawqi Ali
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

1. Course Name:

English Language

2. Course Code:

U013301

3. Semester / Year:

first semester / **The third**

4. Description Preparation Date:

26\2\2024

5. Available Attendance Forms:

Actual presence

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

theoretical 2 practical units 1

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

Name: Asst.prof. Dr. Ahmed Merza Abood
Email : ahmedme@mu.edu.iq

8. Course Objectives

Course Objecti	**- Teaching students, the basic concepts related to access to the simple basics of introduction to the English language for students of the College of Agriculture.** **- The student gets to know the concept of the English language.** **- Enabling students to know how to deal with the English language**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**It's a wonderful world:** **- Tenses** **- Auxiliary verbs** **- Short answers** **- What's in a word?**	**1**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities**

		- Social expressions			**in class**
the secon	2	**Get happy!** **- Simple or continuous?** **- Passive** **- Sport** **- Numbers and dates**	**2**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the third	2	**Telling tales:** **- Past tenses** **- Passive** **- Art and literature** **- Giving opinions**	**3**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the fourth	2	**Doing the right thing:** **- Modal verbs 1** **- Obligation and permission** **- Nationality words** **- Requests and offers**	**4**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Fifth	2	**On the move:** **- Future forms** **- The weather** **- Travelling**	**5**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Sixth	2	**I just love it:** **- Like** **- Verb patterns** **- Describing food, towns, and people** **- Signs and sounds**	**6**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Seventh	2	**The world of work:** **- Present perfect active and passive** **- Phrasal verbs** **- On the phone**	**7**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eighth	2	**Just imagine!** **- Conditionals** **- Time clauses** **- Base and strong adjectives** **- Making suggestions**	**8**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Ninth	2	**Getting on together:** **- Modal verbs 2** **- Probability** **- Character adjectives** **- So do I! Neither do I!**	**9**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Tenth	2	**Obsessions:** **- Present perfect continuous** **- Time expressions** **- Compound nouns** **- Quantity**	**10**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eleventh	2	**Tell me about it!**	**11**	**Explanation,**	**The exam,**

		- Indirect questions **- Question tags** **- The body** **- Informal English**		**presentation of model and lecture**	**Quizzes, Reports, and activities in class**
Twelfth	2	**Life's great events!** **- Reported speech** **- Reporting verbs** **- Birth, marriage, and death** **- Saying sorry**	**12**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Thirteent	2	**Writing:** **- Correcting mistakes 1** **- Letters and emails** **- A narrative 1** **- For and against** **- Making a reservation** **- A description 1** **- A letter of Application** **- A narrative 2** **- A description 2** **- Writing a biography** **- Words that join ideas** **- Correcting mistakes 2**	**1-12**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
fourteent	2	**Pairwork activities:** **- Practice** **- Vocabulary** **- Reading and speaking** **- Problems**	**1-12**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Fifteenth	2	**Reviewing**	**1-12**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**

11. Course Evaluation

1-Theoretical tests	35
2- Quizzes, Reports, and Class's Activities	15
4- Final exam	50

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Intermediate Student's Book: New Headway Plus (John and Soars) Oxford University Press
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	**Internet network**

Course Description Form

1. Course Name:
Soil physics
2. Course Code:
0013301
3. Semester / Year:
THIRD
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
7. Course administrator's name (mention all, if more than one name)
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq
8. 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.**

9. 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

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	4	**ntroduction and definition soil science, soil physics a some related relationships**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
the secon	4	**Physical soil properties, s texture, particle s distribution, and Stock's law**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
the third	4	**The specific area of soil a methods for determining physically and chemically**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
the fourth	4	**Soil Structure: its definiti importance, and how to study**	**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 aggrega methods of studying them, a factors affecting the format of aggregates**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	**Soil water and general wa properties, soil air, air capac and gas exchange in the soil**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	**Water properties related porous media (soil), soil wa energy and methods expressing and measuring it**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	**Soil temperature, s temperature, and heat flow the soil**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	4	**Water flow in saturated s and water flow in unsatura soils**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	4	**Water infiltration in s methods for measuring it a equations**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	4	**rrigation and drainage cha the physical properties surface soil**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	**Water balance and ene balance in the field**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	4	**Evaluation of the water bala equation, water consumpti evapotranspiration**	**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4		**Soil physics**	**Explanation, presentation of model and lecture**	**the exam**

11. Course Evaluation	
1-Theoretical tests 25 2- Practical tests 15 3- Reports and studies 10 4- Final exam 50	
12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	1- Soil Physics, written by Dr. Hisham Mahmoud Hassan 200 2- Basics of soil physics, translation. Mahdi Ibrahim Odeh 19
Main references (sources)	Basics of soil physics, translation. Mahdi Ibrahim Odeh 1990
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil physics**

Course Description Form

1. Course Name:
remote sensing
2. Course Code:
0C23302
3. Semester / Year:
THIRD
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
7. Course administrator's name (mention all, if more than one name)
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq
8. Course Objectives

Course Objecti	**1- It examines the concept of remote sensing, and the elements and applications remote sensing** **2- Researches the interactions of electromagnetic energy and spectral reflectivity and**

	factors affecting them **3- Knowing the sensors, their types and characteristics, as well as examining aerial a satellite images** **4- Studying methods for classifying satellite images** **5- The student's knowledge of geographic information systems (GIS) and their uses**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	**History and target of rem sensing**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
the secon	4	**Electromagnetic energy a parts of the electromagne spectrum**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
the third	4	**Energy interaction w environmental components**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
the fourth	4	**Spectral reflectivity and fact 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 a their characteristics**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	**Rules for classifying aer photographs**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	**Types of characteristics of sp platforms**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	**Types and characteristics**	**remote sensing**	**Explanation,**	**the exam**

		sensors		**presentation of model and lecture**	
The tenth	4	**Types and properties of satel 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 satel images**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	**Remote sensing applications**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	4	**Geographic information syste**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4		**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Remote sensing science: Prof. Dr. Ahmed Saleh Al-Mashhada 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 Referenc Websites	**Google earth ،USGS**

Course Description Form

1. Course Name:

Drainage

2. Course Code:

0023301

3. Semester / Year:

THIRD

4. Description Preparation Date:

26\2\2024

5. Available Attendance Forms:

Actual presence

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

2 theoretical 3 practical units 3.5

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

Name: Dr. AULA HUSSEIN ALI
Email: Aula.alobeidi@mu.edu.iq

8. Course Objectives

Course Objecti	**It examines the concept of drainage, the types of drains, the basic purpose of th construction, and the characteristics of the soil related to drainage** **The relationship of drainage to plant growth and productivity, as well as the patterns distribution of drains networks and the requirements for implementing sewers.** **Mechanization and maintenance of drains of all kinds.**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	The concept of drainage, the purpos constructing drains, the relationship drainage to plant growth productivity	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
the secon	4	Physical soil properties related drainage	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
the third	4	The hydrological cycle and the loca of irrigation and drainage therein	**drainage**	**Explanation, presentation of**	**the exam**

				model and lecture	
the fourth	4	Drainage, soil salinity, leach requirements and salt balance	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Fifth	4	Investigations required to establish drains	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	4	Water flow in the soil and relationship to the concept of drain Analysis of flow	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	Measurement of saturated w conductivity	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	Types of drains, their classification, the objectives of their establishment	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	Open drains and covered drains	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	4	Incisive and vertical drains and desig drains systems	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	4	drain network distribution patterns	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	4	Mechanization of drains and supplies implementing drains	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	Maintenance of covered drains, meth of cleaning them, causes malfunctions, and processing in drain system	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	4	Maintenance of open drains	**drainage**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4	Designs of open and covered d systems and calculation of distar between drains	**drainage**	**Explanation, presentation of model and lecture**	**the exam**

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Drainage (investigations, designs, implementation a maintenance). Dr. Mohsen Muhareb Awad Al-Lami and Dr. Al Saleh Abdul-Jabbar Al-Janabi. Iraq . Ministry of High Education and Scientific Research. University of Al Mosul .
Main references (sources)	Field drainage engineering
Recommended books and	Iraqi academic scientific journals

references (scientific journals, reports…)	
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

1. Course Name:
Irrigation
2. Course Code:
0013304
3. Semester / Year:
THIRD
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
7. Course administrator's name (mention all, if more than one name)
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq
8. Course Objectives

Course Objecti	**1-It discusses irrigation, the science of irrigation, the tasks of each of them, the sources irrigation, methods of controlling it, and exploiting water resources** **2- Researches how to design, plan and implement irrigation facilities** **3-Studies how to calculate plant water needs and water consumption.** **4- Apply and calculate irrigation efficiency, irrigation interval, and irrigation water depth** **5-Study measuring water using different methods** **6-Knowledge of traditional irrigation methods and modern irrigation methods and difference between them.**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	4	The concept of irrigation, irrigation ancient and modern times	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
the secon	4	Irrigation water sources, irrigation w quality	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
the third	4	Soil physical properties associated irrigation	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
the fourth	4	The relationship of water with soil, moisture constants, movement of w in the soil, water flow	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Fifth	4	Water measurement	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	4	Plant water consumption	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	Water requirements and irriga scheduling	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	Transport and distribution of irriga water, movement of water in pipes open channels	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	Design of soil and lined irriga channels	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	4	Efficiency, adequacy and consistenc irrigation	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	4	Traditional irrigation methods	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	4	Modern irrigation methods	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	Modern irrigation methods rationalization of water use	**Irrigation**	**Explanation, presentation of**	**the exam**

				model and lecture	
fourteent	4	Pumping water and how to calcu pump capacity	**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4		**Irrigation**	**Explanation, presentation of model and lecture**	**the exam**

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	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. 2-Irrigation and drainage, written by Dr. Laith Khalil Ismail 2000 Ministry of Higher Education and Scientific Research - University of Mosul 3- Modern irrigation technologies and other topics in the wa issue, written by Dr. Issam Khudair Al-Hadithi, Dr. Ahm Madloul Al-Kubaisi, and Dr. Yas Khudair Hamza Al-Hadit 2010, Ministry of Higher Education and Scientific Researcl Anbar University
Main references (sources)	1- 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 . 2- Modern irrigation technologies and other topics in the wa issue, written by Dr. Issam Khudair Al-Hadithi, Dr. Ahm Madloul Al-Kubaisi, and Dr. Yas Khudair Hamza Al-Hadit 2010, Ministry of Higher Education and Scientific Researcl Anbar University
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

1. Course Name:
Soil Chemistry
2. Course Code:
0013302
3. Semester / Year:
Semester\ 3
4. Description Preparation Date:
27/2/2024
5. Available Attendance Forms:
Attend
6. Number of Credit Hours (Total) / Number of Units (Total)
4 3
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Dr. bashar mezher jader Email: bashar_mezher@mu.edu.iq
8. Course Objectives

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

9. 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.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	Soil chemistry
Main references (sources)	Books related to the subject and scienti research
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://onlinelibrary.wiley.com/doi/full/10.1002/9781119300762.wsts0

Course Description Form

13. Course Name:
Soil Salinity
14. Course Code:
0023303
15. Semester / Year:
Fourd
16. Description Preparation Date:
26\2\2024
17.Available Attendance Forms:
Actual presence
18.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
19. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. G. B. Noni Email: ghanem-bahlol@mu.edu.iq

20. Course Objectives

Course Objecti	• **The student gets to know the classification and types of fertilizers and the importance** • **• For the student to learn about methods of adding fertilizers** • **• The student should separate the positive and negative aspects of fertilize and its harm to plants** • **• For the student to recognize pollution from chemical fertilizers** • **• The student should evaluate soil fertility** •

21. 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

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**The student gets to know the concept of saline soils**	**Soil Salinity**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**For the student to know the sources of salts**	Soil Salinity	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**The student will be familiar with the means of transporting salts**	Soil Salinity	**Explanation, presentation of model and lecture**	**the exam**
the fourth	2	**The student will be familiar with the stages of soil salinization**	Soil Salinity	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student will be familiar with the conditions of soil salinization**	Soil Salinity	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**student gets to know the types of saline and sodic soils**	**Soil Salinity**	**Explanation, presentation of**	**the exam**

				model and lecture	
Seventh	2	For the student to recognize the aspects the effect of salinity on plant growth	Soil Salinity	Explanation, presentation of model and lecture	the exam
Eighth	2	The student will be familiar with the indicators for determining the effect of salinity	Soil Salinity	Explanation, presentation of model and lecture	the exam
Ninth	2	The student will be familiar with the means of increasing the ability of plants tolerate salinity	Soil Salinity	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 determine the quality of irrigation wate	Soil Salinity	Explanation, presentation of model and lecture	the exam
Eleventh	2	The student will be familiar with irrigation water classification systems	Soil Salinity	Explanation, presentation of model and lecture	the exam
Twelfth	2	The student will learn how to live with salinity	Soil Salinity	Explanation, presentation of model and lecture	the exam
Thirteent	2	For the student to become familiar w the problems of limestone soils	Soil Salinity	Explanation, presentation of model and lecture	the exam
fourteent	2	The student will be familiar with the means of increasing the ability of plants tolerate salinity	Soil Salinity	Explanation, presentation of model and lecture	the exam
Fifteenth	2		Soil Salinity	Explanation, presentation of model and lecture	the exam

23. Course Evaluation

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

24. Learning and Teaching Resources

Required textbooks (curricu books, if any)	11- Soil salinity. 2012. Dr. Haider Ai-Zoubedi.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

25.Course Name:
sustainable development
26.Course Code:
U023401
Semester / Year: Chapter Two/Four
27.
28.Description Preparation Date:
29.Available Attendance Forms:
Actual presence
30.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 0 practical units 2
31.Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. raheem alwan halool Email: Rahim_alwan@mu.edu.iq
32.Course Objectives

Course Objectives	For the student to know the types of sustainable development • The student should classify sustainable development and its benefits to the environment • 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 •

33.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

34. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
The first	5 5 5	The student gets to know the ecosystems of sustainable agriculture	Sustainable development	Explanation, presentation of the model and lecture	the exam

The second	5	is for the student to become familiar with the use of renewable resources	Sustainable developme nt		
Third	5	The student learns about reducing toxic substances in the environment	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Fourth	5	The student gets to know soil conservation	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Fifth	5	: The student learns about water conservation	Sustainable developme nt	Explanati on, presentati on of the	the exam

				model and lecture	
Sixth	5	: The student learns about energy conservation	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Seventh	5	: The student gets to know the preservation of seeds and seeds	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Eighth	5	The student gets to know capital in the sustainable agricultural system	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Ninth	5	The student gets to know the	Sustainable developme nt	Explanati on, presentati	the exam

		management of the animal and plant ecosystem		on of the model and lecture	
Tenth	5	: The student will learn about enhancing and preserving natural life	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Eleventh Twelfth	5 5	The student gets to know Recycling and preserving items The student gets to know the economics of natural resources	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam the exam
hirteenth	5	: The student knows how to manage human	Sustainable developme nt	Explanati on, presentati	the exam

		capital		on of the model and lecture	
Fourteenth	5	: The student gets to know sustainable agriculture	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
Fifteenth	5	The student gets to know the types of sustainable natural energy	Sustainable developme nt	Explanati on, presentati on of the model and lecture	the exam
35.Course Evaluation					
Theoretical tests 40 2- Practical tests - 3- Reports and studies 10					

4- Final exam 50

36.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

97. Course Name:
Desertifiation
98. Course Code:
0023405
99. Semester / Year:
Fourd
100. Description Preparation Date:
26\2\2024
101. Available Attendance Forms:
Actual presence
102. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 2
103. Course administrator's name (mention all, if more than one name)
Name:Ass. Prof. Ahmed k.fazza Email ahmad.kadem @mu.edu.iq
104. Course Objectives

Course Objecti	• **The student gets to know the classification and types of fertilizers and the importance** • **• For the student to learn about methods of adding fertilizers** • **• The student should separate the positive and negative aspects of fertilize and its harm to plants** • **• For the student to recognize pollution from chemical fertilizers** • **• The student should evaluate soil fertility** •

105. 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

106. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**The student gets to know the concept of Desertification**	**Desertificatio**	**Explanation, presentation of model and lecture**	**the exam**
the secon	Of Des tifi ion	**For the student to know the resources of Desertification**	Desertificatio	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**The student will be familiar with the mea of SGS**	Desertificatio	**Explanation, presentation of model and lecture**	**the exam**
the fourth	2	**The student will be familiar with the stag of Desertification**	Desertificatio	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student will be familiar with the conditions of soil Deserteficition**	Desertificati	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**student gets to know the types ofDesertification**	**Desertifiaca n**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**For the student to recognize the aspects o the effect of Deserification**	**Desertificati**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**The student will be familiar with the indicators for determining the effect of Desertification**	**Desertificati**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**The student will be familiar with the mea of increasing the ability of plants to tolera Desertification**	**Desertificati**	**Explanation, presentation of model and lecture**	**the exam**

The tenth	2	**The student will be familiar with the facto determining the quality of irrigation wate and the indicators used to determine the quality of irrigation water**	**Desertificati**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	**The student will be familiar with irrigatio water classification systems**	**Desertificati**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	2	**The student will learn how to live with Desertefication**	**desertificati**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	2	**For the student to become familiar with problems of limestone soils**	**Deserificatio**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**The student will be familiar with the mea of increasing the ability of plants to tolera Desertification**	**Desertefica**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	2			**Explanation, presentation of model and lecture**	**the exam**

107. Course Evaluation

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

108. Learning and Teaching Resources

Required textbooks (curricu books, if any)	11Desertification. Desertification in iraq.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

1. Course Name:

Modern irrigation technology

2. Course Code:

0013407

3. Semester / Year:
Fourth
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
7. Course administrator's name (mention all, if more than one name)
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq
8. Course Objectives

Course Objecti	**1- Researches the concept of modern irrigation systems technologies.** **2- Researches ancient and modern irrigation technologies and the difference betw them.** **3- The student evaluates the cost of maintaining irrigation and drainage projects.** **4- The student's knowledge of the philosophy of modern irrigation technologies.** **5- Study the components of modern irrigation systems and methods of maintaining then** **6- Introducing the student to the importance of rationalizing water consumption and wat harvesting.**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

first	4	Introduction, irrigation network, ba of irrigation system design	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
the secon	4	Design factors, water consumpt irrigation interval, and irrigation dept	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
the third	4	Surface irrigation. Surface irriga mechanism, water balance in irrigatio	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
the fourth	4	Strip irrigation, design assumptions determinants, rate and depth of flow.	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Fifth	4	Line irrigation, considerations and assumptions	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	4	Philosophy of modern irriga technologies, water requirements u modern irrigation systems	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	Sprinkler irrigation, components of sprinkler irrigation system, types sprinkler irrigation systems	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	Uniformity of spray water distribut overlapping spray patterns, consiste coefficient of water distribution u sprinklers	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	Hydraulics of flow in pipes, permiss change in pressure	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	4	Drip irrigation, the main parts of the irrigation system, drippers	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	4	Hydraulic drippers, wet area	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	4	Design water requirement for irrigation,	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	Advantages and disadvantages sprinkler and drip irrigation. Maintai the sprinkler and drip irrigation syste	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	4	Center pivot irrigation, its compone advantages and disadvantages, type characteristics of the sprinkler pack used to distribute water	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4	Rationalization of water consumpt water harvesting and its importance..	**Modern irrigation technology**	**Explanation, presentation of model and lecture**	**the exam**

11. Course Evaluation

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

12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	1-Modern irrigation technologies and other topics in the wat -issue, written by Dr. Issam Khudair Al-Hadithi, Dr. Ahmed Madloul Al-Kubaisi, and Dr. Yas Khudair Al-Hadithi, 2010. Ministry of Higher Education and Scientific Research. Anbar University. 2- Field Irrigation Systems Engineering 1992, written by Ahmed Youssef Hajim and Haqqi Ismail Yassin. Ministry Higher Education and Scientific Research, University of Mos College of Engineering.
Main references (sources)	1-Field Irrigation Systems Engineering 1992, written by Dr. Ahmed Youssef Hajim and Haqqi Ismail Yassin. Ministry of Higher Education and Scientific Research, University of Mosu College of Engineering. 2- Irrigation, its basics and applications, written by Dr. Na Ibrahim Al-Taif and Dr. Issam Khudair Al-Hadithi 19 Ministry of Higher Education and Scientific Resear University of Baghdad.
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

37. Course Name:
Soil Classification
38. Course Code:
0013401
39. Semester / Year:
Fourd
40. Description Preparation Date:
26\2\2024
41.Available Attendance Forms:
Actual presence
42.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5

43. Course administrator's name (mention all, if more than one name)
Name:As. ProfAhmed K.fazaa Email ahmad.kadem @mu.edu.iq

44. Course Objectives	
Course Objecti	• **The student gets to know the classification and types of fertilizers and the importance** • **• For the student to learn about methods of adding fertilizers** • **• The student should separate the positive and negative aspects of fertilize and its harm to plants** • **• For the student to recognize pollution from chemical fertilizers** • **• The student should evaluate soil fertility** •

45. 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

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**The student gets to know the concept of Classification**	**Soil Classification**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**For the student to know the metheds of Soil Classification**	Classification	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**The student will be familiar with the means of Formation soil**	Classification	**Explanation, presentation of model and lecture**	**the exam**
the fourth		**The student will be familiar with the Soil survey**	Classification	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student will be familiar with the conditions of soil formation**	Classifiation	**Explanation, presentation of**	**the exam**

				model and lecture	
Sixth	2	student gets to know the types Rocks	Classificatior	Explanation, presentation of model and lecture	the exam
Seventh	2	For the student to recognize the aspects the earth systems	Classificatior	Explanation, presentation of model and lecture	the exam
Eighth	2	The student will be familiar with the indicators for determining the effect of Geology	Classificatior	Explanation, presentation of model and lecture	the exam
Ninth	2	The student will be familiar with the means of increasing the ability of Fiel survvey	Classificatio	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 determine the quality of irrigation wate	Classificatio	Explanation, presentation of model and lecture	the exam
Eleventh	2	The student will be familiar with irrigati water classification systems	Classificatior	Explanation, presentation of model and lecture	the exam
Twelfth	2	The student will learn Fao classificatio	Classificatior	Explanation, presentation of model and lecture	the exam
Thirteent	2	For the student to become familiar with problems of limestone soils	classification	Explanation, presentation of model and lecture	the exam
fourteent	2	The student will be familiar with the means of increasing the ability of plants tolerate salinity	classification	Explanation, presentation of model and lecture	the exam
Fifteenth	2		Soil classification	Explanation, presentation of model and lecture	the exam

47. Course Evaluation

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

48. Learning and Teaching Resources

Required textbooks (curricu books, if any)	11- siol classification dr. Ahmed ALmashedany
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals

Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

1. Course Name:
English Language
2. Course Code:
U013401
3. Semester / Year:
first semester / **The fourth**
4. Description Preparation Date:
26\2\2024
5. Available Attendance Forms:
Actual presence
6. Number of Credit Hours (Total) / Number of Units (Total)
theoretical 2 practical units 1
7. Course administrator's name (mention all, if more than one name)
Name: Asst.prof. Dr. Ahmed Merza Abood Email : ahmedme@mu.edu.iq
8. Course Objectives

Course Objecti	**- Teaching students, the basic concepts related to access to the simple basics of introduction to the English language for students of the College of Agriculture.** **- The student gets to know the concept of the English language.** **- Enabling students to know how to deal with the English language**

9. 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**No place like home:** **- The tense system** **- Informal language** **- Compound words** **- Social expression**	**1**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
the secon	2	**Been there, done that!** **- Present perfect** **- Simple and continuous** **- Hot verbs-make, do** **- Exclamations**	**2**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the third	2	**What a story!** **- Narrative tenses** **- Writing narratives** **- Vocabulary and speaking** **- Everyday English**	**3**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
the fourth	2	**Nothing but the truth:** **- Questions and negatives** **- Prefixes and antonyms** **- Being polite**	**4**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Fifth	2	**An eye to the future:** **- Future forms** **- Hot verbs-take, put** **- Telephoning**	**5**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Sixth	2	**Making it big:** **- Expressions of quantity** **- 'export and ex'port** **- Business expressions and numbers**	**6**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Seventh	2	**Getting on together:** **- Modals and related verbs 1** **- Hot verb get** **- Exaggeration and understatement**	**7**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eighth	2	**Going to extremes:** **- Relative clauses** **- Participles**	**8**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports,**

		- Adverb collocations **- The world around**			**and activities in class**
Ninth	2	**Things ain't what they used to be!** **- Expressing habit** **- Used to do/doing** **- Homonyms/Homophones** **- Making your point**	**9**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**

Tenth	2	**Risking life and limb:** **- Modal auxiliary verbs 2** **- Synonyms** **- Metaphors and idioms-the body**	**10**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Eleventh	2	**In your dreams:** **- Hypothesizing** **- Expressions with if** **- Word pairs** **- Moans and groans**	**11**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
Twelfth	2	**It's never too late:** **- Articles** **- Determiners** **- Hot words-life, time** **- Linking and commenting**	**12**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Thirteent	2	**Writing:** **- Applying for a job-a CV and a covering letter** **-Informal Letters-correcting mistakes** **- Narrative writing 1** **- Linking ideas** **- Emailing friends** **- Report writing- a consumer survey** **- Arguing your case-for and against** **- Descripting places-my favourite part of town** **- Writing for talking -what I want to talk about is …** **- Formal and informal letters and emails-do's and don'ts** **- Narrative writing 2** **- Adding emphasis in writing**	**1-12**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports, and activities in class**
fourteent	2	**Extra material:** **- Everyday English** **- Practice (Exchanging information)** **- Speaking and listening (dream come true)** **- Practice (news and responses)** **- Everyday English (roleplay)** **- Practice (Quiztime!)** **- Vocabulary and pronunciation** **- The pace of life**	**1-12**	**Explanation, presentation of model and lecture**	**the exam, Quizzes, Reports, and activities in class**
Fifteenth	2	**Reviewing**	**1-12**	**Explanation, presentation of model and lecture**	**The exam, Quizzes, Reports,**

					and activities in class

11. Course Evaluation	
1-Theoretical tests 2- Quizzes, Reports, and Class's Activities 4- Final exam	35 15 50

12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	Upper-Intermediate Student's Book: New Headway Plus (Jo and Liz Soars) Oxford University Press
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	**Internet network**

Course Description Form

49. Course Name:
Plant Nutrition
50. Course Code:
0013404
51. Semester / Year:
First
52. Description Preparation Date:
26\2\2024
53.Available Attendance Forms:
Actual presence
54.Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
55. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Falah Hasan Issa Email: flah70-hasan@mu.edu.iq
56. Course Objectives

Course Objecti	• **The student gets to know Plant Nutriti0n** • **The student should classify Nutrient elements** • **The student should detail the benefits and harms of elements factors such as Macro and Micro elements** • **The student should know about nutrient solution** •

57. 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

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2		**Plant Nutrition**	**Definition of pl nutrition, conditi for the nutrient a its importance.**	**the exam**
the secon	2		Plant Nutrition	**Distribution nutrients according their concentratio physiological functi and factors affect them**	**the exam**
the third	2		Plant Nutrition	Organic matt its definitio types, a conditions for decomposition	**the exam**
the fourth	2		Plant Nutrition	Foliar fertilizati	**the exam**
Fifth	2		Plant Nutrition	**Factor determin plant growth**	**the exam**
Sixth	2		Plant Nutrition	Soilless agriculture: definition, importa and histor	**the exam**

				overview	
Seventh	2		Plant Nutrition	Types of soill agriculture and advantages of each	**the exam**
Eighth	2		Plant Nutrition	Preparing the nutri solution	**the exam**
Ninth	2		Plant Nutrition	**Magnet technology: definition, typ importance a disadvantages**	**the exam**
The tenth	2		Plant Nutrition	Ionic antagonisı	**the exam**
Eleventh	2		Plant Nutrition	**The effect of ma elements on plants**	**the exam**
Twelfth	2		Plant Nutrition	**The effect of m elements on plants**	**the exam**

59. Course Evaluation

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

60. Learning and Teaching Resources

Required textbooks (curricu books, if any)	1- Plant Nutrition. 2014. Part 1 .Dr.NoorAldien Shawqi 2- Plant Nutrition. 2014. Part 2 .Dr.NoorAldien Shawqi
Main references (sources)	Plant Nutrition
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Plant Nutrition Journal** .

Course Description Form

25. Course Name:
Soil Soil management
26. Course Code:
0023403

27. Semester / Year:

Second Fourth

28. Description Preparation Date:

26\2\2024

29. Available Attendance Forms:

Actual presence

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

2 theoretical 3 practical units 3.5

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

Name: Assistant Prof Mustafa Abed Manshood
Email: Mustafa.manshood@mu.edu.iq

32. Course Objectives

Course Objecti	• **Understanding the development tools for soil conservation for opti exploitation of land and water and their relationship to erosion, t knowing the effects resulting from them.** • **And ways to process it for the purpose of use and management**

33. 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

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	5	**The student gets to know introduction to the concept a objectives of educatio management**	**Soil management**	**Explanation, presentation of model and lecture**	**the exam**
the secon	5	**For the student to recognize importance of classifying soi its management, classificat and level of series**	**Soil management**	**Explanation, presentation of model and lecture**	**the exam**
the third	5	**Soil surveying tasks in th**	**Soil management**	**Explanation,**	**the exam**

		management, methods measuring areas on land and the map, choosing import drawing standards.		presentation of model and lecture	
the fourth	5	The student will be famil with the sample and inspect for the purposes administration and scient research, and the rules collecting samples and for agricultural purposes	Soil management	Explanation, presentation of model and lecture	the exam
Fifth	5	The student will know classification of lands agricultural and otl purposes, and how to use s survey reports and maps in s management	Soil management	Explanation, presentation of model and lecture	the exam
Sixth	5	The student gets to know quality of lands and th relationship to production, a the link between the map u the classification unit, and management unit in formation of farm fields.	Soil management	Explanation, presentation of model and lecture	the exam
Seventh	5	The student will be familiar with land use evaluation How to use soil survey repo and maps in soil managemen	Soil management	Explanation, presentation of model and lecture	the exam
Eighth	5	For the student to become familiar with the conditions the lands and soil of Iraq, the types of problems, and how t manage them Practical applications on la valuation methods	Soil management	Explanation, presentation of model and lecture	the exam
Ninth	5	The student will be familiar with diagnosing soil and land problems at the farm level Systematic diagnosis of soil problems on the farm Drawing a map of pedagogi and ideological problems	Soil management	Explanation, presentation of model and lecture	the exam
The tenth	5	The student should become familiar with agricultural planning and the administrative program that the specialist must present to the employer Preparing the administrat map (an attempt at applicati	Soil management	Explanation, presentation of model and lecture	the exam
Eleventh	5	Good ways to use land and conserve soil and water *Observations of wind erosio	Soil management	Explanation, presentation of model and lecture	the exam

Twelfth	5	**The student gets to kn desertification, its types a causes**	**Soil management**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent			**Soil management**	**Explanation, presentation of model and lecture**	**the exam**
fourteent			**Soil management**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth			**Soil management**	**Explanation, presentation of model and lecture**	**the exam**

35. Course Evaluation

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

36. Learning and Teaching Resources

Required textbooks (curricu books, if any)	1- Soil and Land Use Management, 1990, Dr. Walid Khaled Hassan Al-Akidi. 2- Soil management in planning and land use, 1999
Main references (sources)	Soil and land use management
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	

Course Description Form

61. Course Name:
Ferttilizer technology
62. Course Code:
0023401
63. Semester / Year:
Fourd
64. Description Preparation Date:
26\2\2024
65.Available Attendance Forms:

Actual presence

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

2 theoretical 3 practical units 3.5

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

Name: Prof. Dr. Hanoon N. Kadhem
Email: reda@mu.edu.iq

68. Course Objectives

Course Objecti	• **The student gets to know the classification and types of fertilizers and the importance** • **• For the student to learn about methods of adding fertilizers** • **• The student should separate the positive and negative aspects of fertilize and its harm to plants** • **• For the student to recognize pollution from chemical fertilizers** • **• The student should evaluate soil fertility** •

69. 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

70. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**Fertilizers, their types and classificat (fertilizers concepts).**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**Mineral fertilizers: Nitrogen fertiliz their types and behavior in the soil a their manufacture**	Fertilizer technology	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**Phosphate fertilizers, their typ behavior in soil, and manufacturing**	Fertilizer technology	**Explanation, presentation of model and lecture**	**the exam**

the fourth	2	**Potassium fertilizers, their types and th behavior in the soil and th manufacture/Sulphur, calcium a magnesium fertilizers Sulfat, calicium a magnesium fertilizers**	Fertilizer technology	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**Its types, behavior in soil and productio**	Fertilizer technology	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**Micronutrient Fertilizers, their typ behavior in soil, and manufacturing**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**Organic fertilizers (types and methods preparation) Organic fertilizers**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**Biofertilizers, their preparation a methods of adding them**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**Liquid fertilizers and methods preparing them**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	2	**Nano fertilizers (types and methods preparation) Nano fertilizers**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	**Fertilizers Evaluation, Mixing a manufacturing**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	2	**Analytical Fertilizer analysis a evaluation/environmental proble associated with the use of fertiliz (pollution).**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	2	**Economics of using fertilizers**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**Techniques of using chemical fertilizers Iraqi agriculture**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	2	**Fertilizers - type of irrigation systems a types of fertilizers that can be added The movement of fertilizer and eleme in the soil and their impact on pl growth**	**Fertilizer technology**	**Explanation, presentation of model and lecture**	**the exam**

71. Course Evaluation

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

72. Learning and Teaching Resources

Required textbooks (curricu books, if any)	11- Fertilizer Technologies. 2012. Dr. Nour El-Din Shawqi Ali.
Main references (sources)	1- Soil fertility. 2014. Dr.. Nour El-Din Shawky Ali Dr. hamd alla Suleiman

	2- Soil Fertility 1988 Dr. Kazem Mashhout Awad
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

73. Course Name:
Soil-Plant-Water
74. Course Code:
0023404
75. Semester / Year:
76. Description Preparation Date:
77.Available Attendance Forms:
78.Number of Credit Hours (Total) / Number of Units (Total)
79. Course administrator's name (mention all, if more than one name)
Name: Qassim A. Talib Alshujairy Email: qassimtalib@mu.edu.iq
80. Course Objectives

Course Objectives	The objectives of study Soil-Plant-Water course are to provide students with a comprehensive understanding of the relationships between soil, water, and plants

81. 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

82. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1. Understanding Soil Properties: 2. Soil-Water		

			Movement: 3. Plant-Water Relations: 4. Soil-Water-Plant Interactions: 5. Irrigation and Water Management: 6. Soil and Water Conservation: 7. Soil-Water Quality: 8. Sustainable Agriculture: 9. Climate Change Impacts: 10. Applied Research and Technology: 11. Fieldwork and Practical Skills:		

83. 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

84. 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

85. Course Name:
Hydrology
86. Course Code:
0013405

87. Semester / Year:

88. Description Preparation Date:

89. Available Attendance Forms:

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

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

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

92. Course Objectives

Course Objectives	The objectives of a hydrology course are to provide students with a comprehensive understanding of the principles and processes related to the distribution, movement, and properties of water on Earth.

93. 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.

94. 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**		

95. 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	
96. 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

97. Course Name:	
Soil maintenance	
98. Course Code:	
0013402	
99. Semester / Year:	
Second	
100. Description Preparation Date:	
26\2\2024	
101. Available Attendance Forms:	
Actual presence	
102. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
103. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof Mustafa Abed Manshood Email: Mustafa.manshood@mu.edu.iq	
104. Course Objectives	
Course Objecti	• **• Understanding the development tools for soil conservation for opti exploitation of land and water and their relationship to erosion, t**

	knowing the effects resulting from them. • • And ways to process it for the purpose of use and management

105. 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

106. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	5	Introduction to soil and wate conservation, its concept and importance, the relationship soil conservation to other topics, Factors affecting soil formati goals and principles, soil maintenance * Rain data analysis	Soil maintenance	Explanation, presentation of model and lecture	the exam
the secon	5	Clouds and rain *Calculate the maximum fl rate and use the basic wa relations device	Soil maintenance	Explanation, presentation of model and lecture	the exam
the third	5	Al-Sayh *Applications based the general equation of s losses	Soil maintenance	Explanation, presentation of model and lecture	the exam
the fourth	5	Geological erosion *Calculating the gene equation factors for soil los in the field	Soil maintenance	Explanation, presentation of model and lecture	the exam
Fifth	5	Water erosion, its types, the mechanics of its occurrence, and how to control it *Estimate the amounts of w erosion in the field using general equation for w erosion	Soil maintenance	Explanation, presentation of model and lecture	the exam
Sixth	5	T Soil conservation methods, general soil loss equation * Conducting terrace designs	Soil maintenance	Explanation, presentation of model and lecture	the exam
Seventh	5	Wind erosion *Field observations on soil a	Soil maintenance	Explanation, presentation of	the exam

		water management procedur		**model and lecture**	
Eighth	5	**Controlling wind erosion *A visit to a weather station Samawah**	**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	5	**Contour farming, strip and terrace farming *The concept of positivity a its applications**	**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	5	**The nature of land use and its role in soil maintenance *Calculating the amount leachate in the field**	**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	5	**Good ways to use land and conserve soil and water *Observations of wind erosio**	**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	5	**For the student to become familiar with the conditions o the lands and soil of Iraq, the types of problems, and how t manage them Practical applications on la valuation methods**	**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent			**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
fourteent			**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth			**Soil maintenance**	**Explanation, presentation of model and lecture**	**the exam**

107. Course Evaluation

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

108. Learning and Teaching Resources

Required textbooks (curricu books, if any)	1Al-Latif, Nabil Ibrahim 1991. Soil and water conservation. Ministry of Higher Education and Scientific Research. Baghda University -2• Ismail, Laith Khalil, 1985. Soil Conservation. Ministry of Higher Education and Scientific Research. University of Al Mosul. Nineveh. translator. -3 Al-Ani, Abdel Fattah Abdullah, 1987. Soil conservation. Ministry of Higher Education and Scientific Research. Technic Institutes Foundation. Baghdad. -4 Fahd, Ali Abd. 1984. Soil and Water Conservati Engineering. Ministry of Higher Education and Scienti Research. Baghdad University. Baghdad. translator.

Main refe rences (sources)	Articles on land conservation - Dr. Khaled Hassan Al-Khalic Arab Republic of Egypt - 2007
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	

49.Course Name: sustainable development	
Course Description Form	
50.Course Code:	
U023401	
Semester / Year: Chapter Two/Four 51.	
52.Description Preparation Date:	
53.Available Attendance Forms:	
Actual presence	
54.Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 0 practical units 2	
55.Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. raheem alwan halool Email: **Rahim_alwan@mu.edu.iq**	
56.Course Objectives	
Course Objectives	For the student to know the types of analytical methods • The student learns how to analysis water , soil and plant

	• The student should evaluate the scientific reality to maintain analytical methods •

57.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

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first	5 5	The student gets to know introduction about water , soil plant analytical	er , soil and plant analytical	Explanation, presentation of the model and lecture	the exam
The second	5 5	is for the			

		student to know analytical of water			
Third	5	The student learns about soil analytical	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fourth	5	The student gets to know plant analytical	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fifth	5	: The student learns about methods of soil samples	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Sixth	5	: The student	Water , soil and plant analytical	Explanati	the exam

		learns about methods of plant samples		on, presentation of the model and lecture	
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	5	The student gets to know the quantitative and volumetric methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Ninth	5	The student gets to know the quantitative and weighing methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam

Tenth	5	: The student will learn about electrical of a Analytical methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Eleventh Twelfth	5 5	The student gets to know About analytical of spectroscopy The student gets to know Atomic emission methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam the exam
thirteenth	5	: The student knows how the Atomic absorption methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam
Fourteenth	5	: The student gets to know	Water , and p analytical	Explanation,	the exam

		Metal analysis methods		presentation of the model and lecture	
Fifteenth	5	The student gets to know the types of X-ray analysis methods	Water , and p analytical	Explanation, presentation of the model and lecture	the exam

59.Course Evaluation
Theoretical tests 40 2- Practical tests - 3- Reports and studies 10 4- Final exam 50

60.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**

Course Description Form

109. Course Name:
Soil microbiology
110. Course Code:
0013305
111. Semester / Year:
Four
112. Description Preparation Date:
26\2\2024
113. Available Attendance Forms:
Actual presence
114. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
115. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. G. B. Noni Email: ghanem-bahlol@mu.edu.iq
116. Course Objectives

Course Objecti	• **The student gets to know the classification and types of Soil microbiology and their importance** • **• 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**
117. 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

118. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	Historical overview, definition, and	Soil Microbiology	Explanation, presentation of model and lecture	the exam
the secon	2	importance of studying soil microbiolog Sections of soil microbiology	Soil Microbiology	Explanation, presentation of model and lecture	the exam
the third	2	Soil microbial groups: bacteria, fu algae, actinomycetes, archa mycorrhizae.	Soil Microbiology	Explanation, presentation of model and lecture	the exam
the fourth	2	Organic matter: carbon cycle, enzyma activity in soil	Soil Microbiology	Explanation, presentation of model and lecture	the exam
Fifth	2	Biotransformations of N, nitrogen cy urea decomposition, nitration proce mineralization and assimilation, C/N ra	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Sixth	2	Biological nitrogen fixation	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Seventh	2	Biological transformations of phosphor its cycle and the role of microorganisms its transformations	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Eighth	2	Biological transformations of phosphor its cycle and the role of microorganisms its transformations	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Ninth	2	Biological transformations of sulf sulfur cycle, mineralization, microb metabolism, oxidation, and reduction inorganic sulfur compounds.	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
The tenth	2	Biotransformations of iron: oxidati reduction, and decomposition of orga iron compounds	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Eleventh	2	Biotransformations of iron: oxidati reduction, and decomposition of orga iron compounds	Soil Microbiolog	Explanation, presentation of model and lecture	the exam
Twelfth	2	Decomposition of pesticides in soil	Soil Microbiolog	Explanation, presentation of model and lecture	the exam

Thirteent	2	**Relationships between microorganisı the area surrounding the ro (rhizosphere) and the activity microorganisms in this area Factors affecting the growth of**	**Soil Microbiolog**	**Explanation, presentation of model and lecture**	**the exam**
fourteent	2	**microorganisms, growth microorganisms**	**Soil Microbiolog**	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	2	**Factors affecting the growth microorganisms, growth microorganisms**	**Soil Microbiolog**	**Explanation, presentation of model and lecture**	**the exam**

119. Course Evaluation

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

120. Learning and Teaching Resources

Required textbooks (curricu 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 Referenc Websites	**Soil Science Society Of America** **Library Genesis**