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

Academic Program Description Form

University Name: University of Al-Muthanna

Faculty/Institute: College of Agriculture

Scientific Department: Department of desertification combat

Academic or Professional Program Name: Bachelors

Final Certificate Name: Bachelors desertification combat.....

Academic System: semesters

Description Preparation Date: 3-9-2023

File Completion Date: 3-9-2023

Signature:

Head of Department Name:

Flaieh Hamad Kasar

Date:

Signature:

Scientific Associate Name:

Hanoon Naki Kadhem

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 12/2/2024

Signature:

جامعة المثنى - كلية الزراعة
مكتب العميد

Approval of the Dean

أ.م.د. حيدر عبيد الكعبي
العميد

Approval of the Dean

1. Program Vision

The Department of Desertification Combat vision is to be a global leader in education and research dedicated to combating desertification and fostering sustainable environmental practices. The Department of Desertification Combat envisions a world where knowledge, innovation, and community engagement converge to mitigate the impacts of desertification and promote ecological resilience

2. Program Mission

The mission of the Department of Desertification Combat is to advance education, research, and outreach efforts that empower individuals to understand, combat, and adapt to the challenges posed by desertification. Through a multidisciplinary approach, we aim to produce graduates equipped with the knowledge and skills to make significant contributions to environmental conservation and sustainable land management.

3. Program Objectives

1. Provide high-quality academic programs that instill a deep understanding of the causes and consequences of desertification.
2. Foster critical thinking and problem-solving skills to address complex environmental challenges.
3. Conduct innovative research to advance the understanding of desertification processes and develop effective solutions.
4. Collaborate with national and international partners to contribute to the global body of knowledge on desertification.
5. Engage with local communities affected by desertification, providing knowledge and support for sustainable land use practices.
6. Collaborate with governmental and non-governmental organizations to implement community-based initiatives for desertification combat.
7. Integrate modern technologies and remote sensing tools in research and educational practices to enhance monitoring and mitigation efforts.
8. Equip students with the skills to leverage technology for sustainable land management.

4. Program Accreditation

No the program have not program accreditation.

5. Other external influences

Is there a sponsor for the program?

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	11	%8	
College Requirements	18	49	%41	
Department Requirements	26	73	51%	
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First	0C15101	General Physics	2	3
	U015101	Mathematic 1	2	–
	0C15102	Statistics Principles	2	3
	U015102	English language	2	–
	0C15103	Horticulture principles	2	3
	U015103	human rights	1	–
	U015104	Computer Applications 1	–	3
	0C25101	General Chemistry	2	3
	U025101	Mathematics 2	2	–
	0C25102	Principles of field crops	2	3
	U025102	Computer Applications 2	–	3
	0C25103	Plane surveying	2	3
	U025103	Freedom and democracy	1	–

	0025101	Principles Geology	2	3	
	0C25104	Engineering Drawing	–	3	
Second	0C15201	Soil principles	2	3	
	0015201	Micro climate	2	–	
	0C15202	Principles of animal production	2	3	
	0C15203	Agricultural machinery	2	3	
	U015201	Computer applications	2	3	
	0C15204	Principles of microbiology	2	3	
	0015202	Farm desert lands	2	3	
	U015202	English language	2	–	
	0C25201	Plant Protection Principles	2	3	
	0025201	Meteoric weather	2	–	
	0C25202	Pasture management	2	3	
	0025202	Land settlement and amendment	2	3	
	U025201	Arabic Language	2	–	
	0C25203	Agricultural extension principles	2	–	
	U025202	Computer Applications 2		3	
Third	0015301	Hydrology	2	3	
	0015302	Plant Physiology	2	3	
	0015303	Desertification	2	–	
	0C15301	The economics of natural resources	2	–	
	0C15302	Design and analysis of experiments	2	3	
	0015304	Soil, Water and Plant Analysis	2	3	
	0015305	Soil Physics	2	3	
	U015301	English language	2	–	
	0025301	Irrigation and puncture	2	3	
	0025302	Soil fertility	2	3	
	0025303	Desert environment	2	–	
	0025304	Remote Sensing	2	3	
	0025305	Soil chemistry	2	3	
	0025306	Soil, Water and Plant Relationships	2	3	
	0025307	Water Harvesting	2		
forth	0015401	Water quality	2	3	
	0015402	Sustainable development in desert	2	–	

	0015403	Groundwater management	2	3	
	0015404	Geographic information systems	2	3	
	0015405	Soil Microbiology	2	3	
	0015406	Graduated research project	1	–	
	U015401	English language	2	–	
	0015407	Environmental stress	2	3	
	0025401	Salinity and reclamation of desert	2	3	
	0025402	Cattle production	2	3	
	0025403	Desert Soil Management	2	3	
	0025404	Wind and water erosion	2	3	
	0025405	Seminars	1	–	
	0025406	Graduated research project	1	–	
	U025401	Professional ethics	1	–	
	0025407	Soil survey and Classification	2	3	

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements /Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant professor	Agricultural machinery and equipment	Agricultural machinery and equipment			1	
Assistant professor	Animal production	Physiological in poultry			1	
Assistant professor	Agricultural machinery and equipment	Agricultural machinery and equipment			1	
Assistant professor	Vegetable production	plant nutrition			1	
Assistant professor	Horticulture and landscap	Date Palm Physiology			1	
Assistant professor	Horticulture and landscap	Date Palm Physiology			1	
Assistant professor	Soil Science	Soil fertility			1	
Assistant professor	Biology	Genetic engineering and biotechnology			1	
Assistant professor	agricultural economy	Production economics			1	
Lecturer	Animal Production	Fishes			1	
Lecturer	Plant	Field crops			1	

	production					
Lecturer	Horticulture	Ornamental, Medical, and Aromatic Plants				
						Lecturer
						Lecturer
						Assistant lecturer

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

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

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

1- Conduct a comprehensive needs assessment to identify emerging trends, challenges, and opportunities in the field of desertification combat.
2- Analyze industry demands, technological advancements, and changes in environmental policies that may impact the program.
3- Engage with faculty, students, industry professionals, and community stakeholders to gather input on program strengths, weaknesses, and areas for improvement.
4- Form advisory committees or forums to ensure ongoing collaboration and feedback.

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
The first	0C15101	General Physics	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015101	Mathematic 1	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C15102	Statistics Principles	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015102	English language	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C15103	Horticulture principles	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015103	human rights	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015104	Computer Applications 1	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C25101	General Chemistry	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U025101	Mathematics 2	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
The first	0C25102	Principles of field crops	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U025102	Computer Applications 2	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C25103	Plane surveying	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U025103	Freedom and democracy	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025101	Principles Geology	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C25104	Engineering Drawing	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
The second	0C15201	Soil principles	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015201	Micro climate	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔

	0C15202	Principles of animal production	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C15203	Agricultural machinery	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015201	Computer applications	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C15204	Principles of microbiology	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015202	Farm desert lands	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015202	English language	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C25201	Plant Protection Principles	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025201	Meteoric weather	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C25202	Pasture management	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025202	Land settlement and amendment	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U025201	Arabic Language	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C25203	Agricultural extension principles	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U025202	Computer Applications 2	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔

The third	0015301	Hydrology	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015302	Plant Physiology	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015303	Desertification	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C15301	The economics of natural resources	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0C15302	Design and analysis of experiments	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015304	Soil, Water and Plant Analysis	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015305	Soil Physics	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
third	U015301	English language	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025301	Irrigation and puncture	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025302	Soil fertility	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025303	Desert environment	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025304	Remote Sensing	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025305	Soil chemistry	Basic	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔

	0025306	Soil, Water and Plant	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025307	Water Harvesting	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015401	Water quality	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015402	Sustainable development in desert	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015403	Groundwater management	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
Fourth	0015404	Geographic information systems	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015405	Soil Micobiologyr	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015406	Graduated research project	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U015401	English language	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0015407	Environmental stress	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025401	Salinity and reclamation of desert	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025402	Cattle production	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025403	Desert Soil Management	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025404	Wind and water erosion	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔

	0025405	Seminars	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	0025406	Graduated research	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔
	U025401	Professional ethics	**Basic**	✔	✔	✔	✔	✔	✔			✔	✔	✔	✔

Course Description Form

Course Name:
1- General physics
Course Code:
0C15101
Semester / Year:
The first stage/ Chapter one
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Actual presence
Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 2 practical units 1
Course administrator's name (mention all, if more than one name)
Name: aula saad rasool Email: aula.abokehella
Course Objectives

Course Objecti	**General physics investigates natural states of matter, general properties of matter, 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 properties as a solvent.** **Study the concept of viscosity, Newton's law of viscosity** **●Identify optical devices, X-rays.**
Teaching and Learning Strategies	
Strategy	1-Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips

	6 - Self-learning method

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	**The student gets to know the states natural matter, the general properties matter, and the mechanical properties matter**	**General physics**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**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	2	**The student gets to know molecu speeds, molecular forces, collisio between molecules, and therr properties of matter**	General physics	**Explanation, presentation of model and lecture**	**the exam**
the fourth	2	**The student gets to know mechanics: the laws of force and motion, the laws of motion in one dimension, and the free fa of bodies 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 physics	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student gets to know water: molecular structure, its hydrog bonding, and its properties as a solvent**	**General physics**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**The student gets to know surface tension contact angle, and capillary property**	General physics	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**The student will learn about diffusion an the osmotic phenomenon**	General physics	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**The student will learn about viscosity, Newton's law of viscosity**	General physics	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**The student gets to know the flow of flui fluid pressure, and Poiseuille's law**	**General physics**	**Explanation, presentation of model and lecture**	**the exam**

The tenth	2	**The student gets to know Stock's Law, its derivation and applications**	General physics	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	**The student will be familiar with the relationships of volume and weight, density of objects, porosity, surface area and specificity**	General physics	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	2	**The student will be familiar with opti devices and X-rays**	General physics	**Explanation, presentation of model and lecture**	**the exam**

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

Learning and Teaching Resources	
Required textbooks (curric 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 HeatIraqi acader scientific journals
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Physics Pdf Book**

Course Description Form

Course Name:
2- **Surveying**
Course Code:
0C25103
Semester / Year: 2023-2024

Description Preparation Date:

1-9-2023

Available Attendance Forms: Attended

Number of Credit Hours (60) / Number of Units (3)

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

Name: JAWAD KADHIM AL ARIDHEE
Email: jawadaridhee@mu.edu.iq

Course Objectives

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

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 and and thus leveling agricultural lands

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Definition of the surveying, the types of surveys, the		Theoretical + practical lecture	Test

		requirements of a good survey and its the importance in agriculture			
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		Theoretical	Test

		and volumes		+ practical lecture	
13	4	Topographic maps		Theoretical + practical lecture	Test
14	4	Contour lines		Theoretical + practical lecture	Test
15	4	Theodolite device		Theoretical + practical lecture	Test

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Surveying**
Main references (sources)	Basic Farm Machin .J.M.shippen,C.R.Ellin and C.H.Clove
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

Course Name:
3- Freedom and democracy
Course Code:
U015103

Semester / Year:
The first stage/ autumn semester
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Presence
Number of Credit Hours (Total) / Number of Units (Total)
2 practical hours. Number of units: 2
Course administrator's name (mention all, if more than one name)
Name: Dr. Omar Arhaim Jadoa Email: omarjadoa@mu.edu.iq
Course Objectives

Course Objectives	**Teaching the student about human rights as well as the relationship of human rights to other variables**

Teaching and Learning Strategies

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Definition of human rights	A lecture	Quiz
2	2	Theoretical lecture	The emergence and development of human rights	A lecture	Quiz
3	2	Theoretical	A glimpse of human rights in	A lecture	Quiz

		lecture	ancient civilizations		
4	2	Theoretical lecture	Human rights in heavenly religions	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Human rights and their relationship to other variables	A lecture	Quiz
7	2	Theoretical lecture	The relationship of rights to law	A lecture	Quiz
8	2	Theoretical lecture	The relationship of rights and duties	A lecture	Quiz
9	2	Theoretical lecture	The most important basic human rights	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	The impact of globalization on rights	A lecture	Quiz
12	2	Theoretical lecture	Cairo Declaration on Human Rights in Islam	A lecture	Quiz
13	2	Theoretical lecture	The most important international declarations and conventions	A lecture	Quiz
14	2	Theoretical lecture	The most important international declarations and conventions	A lecture	Quiz
15	2	Theoretical lecture	Financial and administrative corruption	A lecture	Quiz

Co2urse Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Human rights and basic freedoms in Iraq Blend Dealer Shawes
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.un.org/ar/about-us/universal-declaration-of-human-rights

Course Description Form

Course Name:	
4- Mathematic	
Course Code:	
U015101	
Semester / Year:	
The first stage/ autumn semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours Number of units: 2	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Mohammed Radwan Mahmood Email: raheemhalol@mu.edu.iq	
Course Objectives	
Course Objectives	**• Enable the student to become familiar with mathematics in general and its applications in various experiments** **• - Enable the student to know and understand mathematics and perform the steps correctly and correctly in solving mathematical problems** **• - Providing the student with the skills to deal with different sections of mathematics and**

	various uses of mathematical applications **• –Enabling the student to solve complex problems and various applications in various fields**

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Classes and functions	A lecture	Quiz
2	2	Theoretical lecture	Mathematical deduction and the binomial theorem	A lecture	Quiz
3	2	Theoretical lecture	Partial fractures	A lecture	Quiz
4	2	Theoretical lecture	Matrices and determinants	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Solve the simultaneous equation using matrices	A lecture	Quiz
7	2	Theoretical lecture	Cramer's rule and coordinates	A lecture	Quiz
8	2	Theoretical lecture	Equation of a straight line in different forms	A lecture	Quiz
9	2	Theoretical lecture	Circle	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Parabola	A lecture	Quiz
12	2	Theoretical lecture	Ellipse	A lecture	Quiz
13	2	Theoretical lecture	Hyperbola	A lecture	Quiz

14	2	Theoretical lecture	Derivative and tangent rules Linking	A lecture	Quiz
15	2	Theoretical lecture	mathematics to statistics	A lecture	Quiz

Co2urse Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Calculus, Gilbert Strang**
Main references (sources)	**1- Calculus Early Transcendentals, 12th Edition, Thomas, Pearson Education.** **2– Calculus, Robert T. Smith & Ronald B. Minton, McGraw- Hill**
Recommended books and references (scientific journals, reports…)	11-Intermediate Algebra, Lynn Marecek, Santa Ana Colle 2-Calculus, David Guichard and others
Electronic References, Websites	http://tutorial.math.lamar.edu/

Course Description Form

Course Name:
5– **Horticulture**
Course Code:
0C15103
Semester / Year:
Description Preparation Date:
01/09/2024
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)

Course administrator's name (mention all, if more than one name)
Name: Emad A.M.Aldahab Email:emad.aldahab@mu.edu.iq
Course Objectives

Course Objectives	**• Introducing the student to the various horticultural crops, their econon nutritional, medical and aesthetic importance, methods of cultivation a production, and identifying various horticultural facilities and methods establishing orchards.** **• Knowledge of horticulture departments** **• Know the difference between horticultural crops and field crops** **• Identify the factors affecting the success of growing horticultural crops** **• Identify the factors determining the establishment of orchards** **• Learn how to create public and private parks and plant trees in cities and central islands**
Teaching and Learning Strategies	
Strategies	Introducing the student to the various horticultural cro their economic, nutritional, medical and aesthe importance, methods of cultivation and production, a identifying various horticultural facilities and methods establishing orchards.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first	2	Learn about horticulture, the history of the development of horticulture, its economic	horticulture, the history of the development of horticulture, its economic	Attend	a daily test

		and nutritional importance	and nutritional importance		
the second	2	Learn how divide horticultural plants	divide horticultural plants	Attend	a daily test
the third	2	Identify environmental factors and th impact on t production horticultural cro	environmental factors and th impact on t production horticultural cro	Attend	a daily test
the fourth	2	Identify t methods reproduction horticultural plants (sexu asexual)	the methods reproduction horticultural plants (sexu asexual)	Attend	a daily test
Fifth	2	Identifying nurseries and fi farming patterns	nurseries and fi farming patterns	Attend	a da test
VI	2	Learn abo agricultural a horticultural processes	agricultural and horticultural processes	Attend	a daily test
Seventh	2	Learn about agriculture unde air-conditioned environments	agriculture unde air-conditioned environments	Attend	a daily test
VIII	2	Getting to know the genie, marketing	the genie, marketing	Attend	a daily test
Ninth	2	Learn about care and storage	care and storage	Attend	a daily test
The tenth	2	Learn about breeding and improving horticultural	breeding and improving horticultural plants	Attend	a daily test

		plants			
eleventh	2	Learn about garden architecture and design	garden architecture and design	Attend	a da test
twelveth	2	Learn about wa to exploit spac and roofs buildings growing horticultural plants	a ways to expl spaces and roofs buildings growing horticultural plants	Attend	a daily test
Thirteenth	2	Identify windbreaks and their role in reducing desertification conditions	windbreaks and their role in reducing desertification conditions	Attend	a daily test
fourteenth	2	Learn how to u modern mechanization serve horticultu plants	how to use modern mechanization t serve horticultu plants	Attend	a daily test
Fifteenth	2	Identifying (medicinal and aromatic plants, fruit trees, vegetable plants, ornamental plants)	(medicinal and aromatic plants, fruit trees, vegetable plants, ornamental plants)	Attend	a daily test

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

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific	

journals, reports…)	
Electronic References, Websites	

Course Description Form

Course Name:	
6- statistics principle	
Course Code:	
0C15102	
Semester / Year:	
FIRST/2023-2024	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
Course administrator's name (mention all, if more than one name)	
Name: sadeq Hadi Hussein Email: Sadeq.hadi@mu.edu.iq	
Course Objectives	
Course Objectives	- Active participation in answering questions - Weekly assignments in order to practice applying the laws - Monthly tests

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

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		

Course Evaluation

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

Course Name:
7- **Geology**
Course Code:
Semester / Year:
firstL2023-2024
Description Preparation Date:
1\9\2023
Available Attendance Forms:
Actual presence
Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
Course administrator's name (mention all, if more than one name)
Name:dr.aula saad rasool abokehella Email aula.abokehella@mu.edu.iq
Course Objectives

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

Teaching and Learning Strategies

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

	6 - Self-learning method

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	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 fourtl		**The student will be familiar with the I 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 model and lecture**	**the exam**
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**

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

Learning and Teaching Resources	
Required textbooks (curric 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

Course Name:
8− English course
Course Code:

U015102

Semester / Year: Semester

First 2023–2024

Description Preparation Date:

3–9–2023

Available Attendance Forms:

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

2hours weekly

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

Name: Lafta Awad Atshan
Email: lafta.awad@mu.edu.iq

Course Objectives

Course Objectives	**English language skills**

Teaching and Learning Strategies

Strategy	

Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2		Sentences strictures		
2	2		Past tense		
3	2		Past simple		
4	2		Past continuous		
5	2		Present tenses		
6	2		Present Simple		
7	2		Present continuous		
8	2		Future tense		
9	2		Future simple		
10	2		Paragraphs writing		
11	2		Paragraphs writing		
12	2		Paragraphs writing		

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Cambridge English: Preliminary
Recommended books and references (scientific journals, reports…)	Cambridge English: Preliminary
Electronic References, Websites	An English videos

Course Description Form

Course Name:
9– computers

Course Code:	
U015104	
Semester / Year:	
Semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Attend	
Number of Credit Hours (Total) / Number of Units (Total)	
6	3
Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor samer saud Email: @mu.edu.iq	
Course Objectives	
Course Objectives	*** This course description provides a necessary summary of the most important characteristics the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available learning opportunities, and this must be linked the program description.** **1- Getting to know office programs, including (Excel).** **2- Managing databases using Excel** **1-The ability to work in all areas of computer use.** **2- Increasing the spirit of competition among students for the sake of academic excellence a obtaining good job opportunities.** **3- Increasing competition among students in order to obtain the opportunity to apply for postgraduate studies** **4- Providing assistance to other institutions.**

Teaching and Learning Strategies	
Strateg	-

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			Familiarity with office programs		
Third			The main interface of Excel		
forth			Save Excel workbooks, autosave, and save edits		
Fifth			Create and manipulate tables in Excel		
Sixth			Identify the types of data that can be entered into Excel cells		
Seventh			First month exam		
Eighth			Writing equations in Excel		
Ninth			Ready-made formulas		
tenth			Types of functions in Excel		

11			How to write a function and get result		
12			Second monthly exam		
13			Table and text formats		
14			Search, replace and alphabet		
15			Practical applications		

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

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

Form

1. Course Name:
Engineering Drawing
2. Course Code:
0C25104
3. Semester / Year:
First semester / **First**
4. Description Preparation Date:

3-9-2023

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	Learning method	Evaluation

			name		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 books, if any)	Engineering drawing for students of the College of Agricultu (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	Engineering drawing books for all engineering disciplines - Noor Library

journals, reports…)	
Electronic Referenc Websites	https://www.gulf-up.com/uz2pnxd1v0st

Second stage

Course Description Form

Course Name:
10- Agricultural machinery and equipment
Course Code:
0C15203
Semester / Year
: 2023-2024
Description Preparation Date:
1-9-2023
Available Attendance Forms: Attended
Number of Credit Hours (60) / Number of Units (3)
Course administrator's name (mention all, if more than one name)
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq
Course Objectives

Course Objectives	is machinery used in farming or other agriculture. There are many types of such equipment, from hand tools and power tools to tractors and the countless kinds of farm implements that they tow or operate. Diverse arrays of equipment are used in both organic and nonorganic farming. Especially since the advent of mechanized agriculture, agricultural machinery is an indispensable part of how the world is fed

Teaching and Learning Strategies

Strategy	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Classification of tractors , Mechanical transmission methods		Theoretical + practical lecture	Test
2	4	Internal combustion engine parts		Theoretical + practical lecture	Test
3	4	Four – stroke cycle& Two – stroke cycle		Theoretical + practical lecture	Test
4	4	Timer device		Theoretical + practical lecture	Test
5	4	Clutch Device		Theoretical + practical lecture	Test
6	4	Gearbox and Transmission devices		Theoretical + practical lecture	Test
7	4	Fuel System		Theoretical + practical lecture	Test
8	4	Cooling System		Theoretical +	Test

				practical lecture	
9	4	Lubrication System		Theoretical + practical lecture	Test
10	4	Hydraulic devices. Power take - off shaft		Theoretical + practical lecture	Test
11	4	Soil preparation equipment		Theoretical + practical lecture	Test
12	4	Control equipment - Spraying equipment		Theoretical + practical lecture	Test
13	4	Fogging equipment		Theoretical + practical lecture	Test
14	4	Sprinkler calibration		Theoretical + practical lecture	Test
15	4	Maintenance of control equipment		Theoretical + practical lecture	Test

Course Evaluation

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

Learning and Teaching Resources

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

Course Description Form

Course Name:	
11- **Lands leveling and grading**	
Course Code:	
0025202	
Semester / Year:	
2023-2024	
Description Preparation Date:	
1-9-2023	
Available Attendance Forms: Attended	
Number of Credit Hours (60) / Number of Units (3)	
Course administrator's name (mention all, if more than one name)	
Name: JAWAD KADHIM AL ARIDHEE Email: jawadaridhee@mu.edu.iq	
Course Objectives	
Course Objectives	Increasing the production of agricultural crops in quanti and quality due to the distribution of water in the field a approximately one depth Ease of irrigation, as the water is distributed evenly throughout the field. This means reducing the amount c water required by the irrigation process and reducing th 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

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

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 -		Theoretical + practical	Test

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

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Surveying**
Main references (sources)	Basic Farm Machinery .J.M.shippen,C.R.E and C.H.Clover
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

Course Description Form

Course Name:
12- pasture management
Course Code:
0C25202
Semester / Year:
SECOND 2023-2024
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)
Name: sadeq Hadi Hussein Email: Sadeq.hadi@mu.edu.iq
Course Objectives

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

Teaching and Learning Strategies	
Strategy	- Introducing students to farm management - The role of management in managing the resources involved in the production process

Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
			1- Introduction to farm management 2-The nature of the costs 3- The principle of equal marginal returns 4- The principle of determining and determining the best level of production 5- The principle of opportunity costs 6-Comparative costs theory 7- Farm budget 8- Farm accounts and		

			records 9- Agricultural planning 10- Measures of economic efficiency on the farm		

Course Evaluation

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Farm Business Management - Hashem Alwan Al-Samarrai
Main references (sources)	Economics of agricultural production - Salem Tawfiq Al-Najafi
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

Course Name:
13- Basis of microbiology
Course Code:
0C15204
Semester / Year:
Semester
Description Preparation Date:
3-9-2023
Available Attendance Forms:
attend
Number of Credit Hours (Total) / Number of Units (Total)
6 3
Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Dr. Dhifaf jabbar shamran Email: dhifaf15@mu.edu.iq
Course Objectives

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

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

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		

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, any)	General microbiology
Main references (sources)	Books related to the subject a scientific research
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

Course Name:
14- agriculture extension principle
Course Code:
0C25203
Semester / Year:
Description Preparation Date:
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)
Name: sadeq Hadi Hussein Email: Sadeq.hadi@mu.edu.iq
Course Objectives

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

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- A historical overview of agricultural extension 2- Types of extension training 3- Communication process 4- The process of adoption and spread of modern innovations 5- Rural leadership 6- Planning extension programs 7- Agricultural extension methods and extension		

			methods 8- The philosophy of agricultural extension 9- Learning and teaching 10- The importance of using modern irrigation methods and their economic effects 11- The role of agricultural extension in preserving archaeological areas 12- Water crisis		

Course Evaluation

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of agricultural extension - Abdullah Al-Samarrai
Main references (sources)	Planning extension programs - Abdullah Al-Samarrai 1992 Agricultural Extension Science - Adnan Hussein Al-Gharji 1990
Recommended books and references (scientific journals,	

reports…)	
Electronic References, Websites	

Course Description Form

Course Name:	
15- computers	
Course Code:	
U015201	
Semester / Year:	
Semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Attend	
Number of Credit Hours (Total) / Number of Units (Total)	
6	3
Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor samer saud Email: @mu.edu.iq	
Course Objectives	
Course Objectives	*** This course description provides a necessary summary of the most important characteristics the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available learning opportunities, and this must be linked the program description.** **1- Getting to know office programs, including (Excel).** **2- Managing databases using Excel** **1-The ability to work in all areas of computer use.** **2- Increasing the spirit of competition among**

	students for the sake of academic excellence a obtaining good job opportunities. **3- Increasing competition among students in order to obtain the opportunity to apply for postgraduate studies** **4- Providing assistance to other institutions.**

Teaching and Learning Strategies	
Strateg	-

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			Familiarity with office programs		
Third			The main interface of Excel		
forth			Save Excel workbooks, autosave, and save edits		
Fifth			Create and manipulate tables in Excel		
Sixth			Identify the types of data that can be entered into Excel cells		

Seventh			First month exam		
Eighth			Writing equations in Excel		
Ninth			Ready-made formulas		
tenth			Types of functions in Excel		
11			How to write a function and get result		
12			Second monthly exam		
13			Table and text formats		
14			Search, replace and alphabet		
15			Practical applications		

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

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

Course Description Form

Course Name:
16- English course
Course Code:
U015202
Semester / Year: Semester
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
2hours weekly
Course administrator's name (mention all, if more than one name)
Name: Lafta Awad Atshan Email: lafta.awad@mu.edu.iq
Course Objectives

Course Objectives	**English language skills**

Teaching and Learning Strategies	
Strategy	

Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1 2 3	2 2 2		Sentences strictures Past tense Past simple		

4 5 6 7 8 9 10 11 12	2 2 2 2 2 2 2 2 2		Past continuous Present tenses Present Simple Present continuous Future tense Future simple Paragraphs writing Paragraphs writing Paragraphs writing		

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Cambridge English: Preliminary
Recommended books and references (scientific journals, reports…)	Cambridge English: Preliminary
Electronic References, Websites	An English videos

Course Description Form

Course Name:	
17- Principles of animal production	
Course Code:	
C152020	
Semester / Year:	
The first stage/ autumn semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours and 3 practical hours. Number of units: 3	
Course administrator's name (mention all, if more than one name)	
Name: Ass. Prof. Saad Atallah Abd sada Email: asadata@mu.edu.iq	
Course Objectives	
Course Objectives	**• It aims for the student to recognize the economic importance of animal production, as well as the sciences associated with it and the relationship of animal production to plant production.**
Teaching and Learning Strategies	

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Introduction to animal production and its economic importance	A lecture	Quiz
2	2	Theoretical lecture	Factors affecting the production efficiency of farm animals	A lecture	Quiz
3	2	Theoretical lecture	Obstacles facing animal production in Iraq and ways to improve them	A lecture	Quiz
4	2	Theoretical lecture	Dairy cows, beef cows and dual-purpose cows	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Establishing and managing a flock of sheep and goats	A lecture	Quiz
7	2	Theoretical lecture	Buffalo, general characteristics of buffalo	A lecture	Quiz
8	2	Theoretical lecture	Poultry birds, the economic importance of poultry projects	A lecture	Quiz
9	2	Theoretical lecture	Nutrition and fodder	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Health care for poultry birds	A lecture	Quiz
12	2	Theoretical lecture	Genetic improvement in poultry	A lecture	Quiz
13	2	Theoretical lecture	Sheep and goats	A lecture	Quiz

			economic importance		
14	2	Theoretical lecture	Classification and methods used for classification	A lecture	Quiz
15	2	Theoretical lecture	Sheep breeding	A lecture	Quiz

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

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Animal Production Zuhair Al-Jalili
Main references (sources)	From methodological books, help books, the Internet, and scientific research
Recommended books and references (scientific journals, reports…)	Scientific journals in basic specializations
Electronic References, Websites	Animal Science Journal

Course Description Form

Course Name:	
18- Principles of soil science	
Course Code:	
0C15201	
Semester / Year:	
The first stage/ autumn semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours and 3 practical hours. Number of units: 3	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Raheem Alwan Halool Email: raheemhalol@mu.edu.iq	
Course Objectives	
Course Objectives	**• Introducing the student to the properties of soil** **• Knowing the types of soil clays** **• Classification of soils and lands in Iraq**
Teaching and Learning Strategies	
Strategy	1 Explanation and clarification 2 Lecture method

	3Student groups 4Practical lessons in laboratories

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	General definitions and concepts of soil	A lecture	Quiz
2	2	Theoretical lecture	Origin and development of soil	A lecture	Quiz
3	2	Theoretical lecture	Physical properties of soil	A lecture	Quiz
4	2	Theoretical lecture	Physical properties of soil	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	Soil water	A lecture	Quiz
7	2	Theoretical lecture	Colloids and soil chemical properties	A lecture	Quiz
8	2	Theoretical lecture	Types of soil clays and their respective	A lecture	Quiz
9	2	Theoretical lecture	characteristics Organic colloids	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Soil salinity	A lecture	Quiz
12	2	Theoretical lecture	Classification of soils affected by salinity	A lecture	Quiz
13	2	Theoretical lecture	Biological properties of soil	A lecture	Quiz
14	2	Theoretical lecture	Important nutrients in the soil	A lecture	Quiz
15	2	Theoretical lecture	Classification of soils and lands in Iraq	A lecture	Quiz

Co2urse Evaluation

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

Learning and Teaching Resources

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

Course Description Form

Course Name:	
19- Principles of protection	
Course Code:	
0C25201	
Semester / Year:	
The first stage/ autumn semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours and 3 practical hours. Number of units: 3	
Course administrator's name (mention all, if more than one name)	
Name: Ass. Prof. Dr. Malik Hassan Kareem Email: malikhassan@mu.edu.iq	
Course Objectives	
Course Objectives	• **It aims to familiarize the student with**

	entomology and its related sciences, insects, their benefits and harms.

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical lecture	Introduction to entomology	A lecture	Quiz
2	2	Theoretical lecture	Insect feeding methods and auxiliary factors	A lecture	Quiz
3	2	Theoretical lecture	Methods of insect reproduction	A lecture	Quiz
4	2	Theoretical lecture	Methods of insect resistance	A lecture	Quiz
5	2	Exam	Exam	Exam	Exam
6	2	Theoretical lecture	The economic mastitis and important factors	A lecture	Quiz
7	2	Theoretical lecture	The nature of life and damage of rodents	A lecture	Quiz
8	2	Theoretical lecture	Economic importance of pests	A lecture	Quiz
9	2	Theoretical lecture	Definitions of disease terms	A lecture	Quiz
10	2	Exam	Exam	Exam	Exam
11	2	Theoretical lecture	Plant pathogens	A lecture	Quiz
12	2	Theoretical lecture	Non-parasitic pathogens	A lecture	Quiz
13	2	Theoretical lecture	Stages of disease development	A lecture	Quiz
14	2	Theoretical lecture	Methods of	A lecture	Quiz

			controlling plant diseases		
15	2	Theoretical lecture	Rodent control	A lecture	Quiz

Co2urse Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

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

Course Description Form

Course Name:
20- Arabic Language
Course Code:
U025201
Semester / Year:
The first stage/spring semester
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Presence

Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours Number of units: 2	
Course administrator's name (mention all, if more than one name)	
Name: Ass. Lecturer Amer Mousa Kadhum Email: amermousak@mu.edu.iq	
Course Objectives	
Course Objectives	**Teaching the student grammar and parsing, as well as rhetoric in the Holy Quran.**
Teaching and Learning Strategies	
Strategy	1 Explanation and clarification 2 Lecture method 3Student groups 4Practical lessons in laboratories

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

Co2urse Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

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

Course Description Form

Course Name:
21- farm of desert lands
Course Code:
0015202
Semester / Year:
the first
Description Preparation Date:

1/9/2023

Available Attendance Forms:

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

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

Name: Dhafer Abdulrheem Shaker
Email: dhaferabdshaker@mu.edu.iq

Course Objectives

Course Objectives	**• Learn how to maintain desert soil.** **• Identify methods for multiplying vegetable crops.** **• Identifying vegetable crops that can be grown in desert areas.** **• Reaching maximum production by using the optimal farming method and the best modern irrigation methods.** **• Using protected agriculture in vegetable production.**

Teaching and Learning Strategies

Strategy	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first	2	Identify the environmental requirements of vegetable crops grown in desert areas	the environmental requirements of vegetable crops grown in desert areas	Attend	a daily test
the second	2	Identifying the agricultural patterns adopted for farming desert areas	the agricultural patterns adopted for farming desert are	Attend	a daily test
the third	2	Identifying vegetable crops that	vegetable crops that		

		can be grown in desert areas: the Solanaceae family.	can be grown in desert areas : the Solanaceae family.	Attend	a daily test
the fourth	2	Getting to know the cucurbit family.	know the cucurbit family.	Attend	a daily test
Fifth	2	Identifying the Allium family and the Tuber family.	the Allium family and the Tuber family.	Attend	a daily test
VI	2	Identify the original homeland of the olive tree	the original homeland of the olive tree	Attend	a daily test
Seventh	2	Identify pollination in olives	pollination in olives	Attend	a daily test
VIII	2	Identify the environmental needs of olives	the environmental needs of olives	Attend	a daily test
Ninth	2	Learn about the botanical description of the palm tree	the botanical description of palm tree	Attend	a daily test
The tenth	2	Identifying palm propagation (with pits, shoots, and shoots)	palm propagation (with pits, shoots, and shoots)	Attend	a daily test
eleventh	2	Identify woody plants, their advantages and characteristics	woody plants, their advantages and characteristics	Attend	a daily test
twelveth	2	Learn about the benefits and uses of trees	the benefits and uses of trees	Attend	a daily test
Thirteent	2	Identify the divisions of trees based on their tolerance to environmental conditions	the divisions of trees based on their tolerance to environmental conditions	Attend	a daily test
fourteent	2	Learn about the methods of reproduction of trees and shrubs	the methods of reproduction of trees and shrubs	Attend	a daily test
Fifteenth	2	Identify the most important trees and shrubs	the most important trees and shrubs	Attend	a daily test

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	**Cultivation of desert lands. Written by Abdullah Qasim Abdullah and Yahya Hussein. Basics of growing and producing vegetables in protected and open lands**

	Desert. Written by Sayed Fathi
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Third stage

Course Description Form

Course Name:
22- Water harvesting
Course Code:
0025307
Semester / Year: Third
Description Preparation Date: 2023-2024
3-9-2023
Available Attendance Forms: In person + electronic
Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 30 hours
Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Muhammad Radwan Mahmoud Email: modrn@mu.edu.iq
Course Objectives

Course Objectives **• 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.**	**e student will be familiar with the mechanism of er harvesting** **roducing the student to Water harvesting**

Teaching and Learning Strategies	
Strategy	**Strategic teaching and learning methods**

	Audio methods (teaching explanation of the topic) **Style of writing on the blackboard** **The method of direct dialogue between the teacher and the student, with student's evaluation in class participation** **Conduct experiments.**

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first week	**2Theoretical**		Introduction (definition of water harvesting, main components of water harvesting system, determining factors of water harvesting system, benefits of water harvesting)		**Exams , reports, discussions**
second week	**2Theoretical**		Rainwater harvesting techniques		**Exams , reports, discussions**
the third week	**2Theoretical**		Techniques for harvesting valley water (floods)		**Exams , reports, discussions**
fourth week	**2Theoretical**		Reliability of water provision,		**Exams , reports, discussions**
The fifth week	**2Theoretical**		, storage capacity estimate		**Exams , reports, discussions**
the sixth week	**2Theoretical**		total rainfall amount, catchment area estimate		**Exams , reports, discussions**
Seventh week	**2Theoretical**		**First monthly exam**		**Exams , reports, discussions**
The eighth week	**2Theoretical**		Factors of circulating rainwater harvesting system		
Week nine	**2Theoretical**		Principles of planning for water harvesting projects		**Exams , reports, discussions**
The tenth week	**2Theoretical**		Water tanks		**Exams , reports, discussions**

Week eleven	**2Theoretical**		Sediments in tanks and their shelf life		**Exams , reports, discussions**
The twelfth week	**2Theoretical**		Dams, types of dams, their components, and dam collapse		**Exams , reports, discussions**
The thirteenth week	**2Theoretical**		Dams, types of dams, their components, and dam collapse		**Exams , reports, discussions**
The fourteenth week	**2Theoretical**		Dams, types of dams, their components, and dam collapse		**Exams , reports, discussions**
The fifteenth week			**The second monthly exam**		

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Justine Anschütz, Antoinette Kome, Marc Nederlof,Rob de Neef, Ton van de Ven 2012,Water harvesting and soil moisture retention
Main references (sources)	Water harvesting and soil moisture retention Translated into Arabic Muhammad Radwan
Recommended books and references (scientific journals, reports...)	Iraqi -reviewed journals **/https://www.elsevier.com**
Electronic References, Websites	**https://icwrae-psipw.org/papers/2006/Arabic/Water/A9.pdf**

صادر2)

Course Description Form

Course Name:	
23- Soil Chemistry	
Course Code:	
0025305	
Semester / Year:	
Semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Attend	
Number of Credit Hours (Total) / Number of Units (Total)	
4	3
Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Dr. bashar mezher jader Email: bashar_mezher@mu.edu.iq	
Course Objectives	
Course Objectives	**The soil chemistry course aims to explain principles used in studying the chemical composit of soil. During this course, the student is introdu to all the chemical properties of soil and how estimate and calculate them practically and in field. During this course, all chemical properties soil are linked to other branches of soil science.**
Teaching and Learning Strategies	
Strategy	• Make the learner active and effective in educatio situations. • Teach students to respect different opinions and val

	others • Benefit from other people's ideas and information.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	5	The importar of studying sc chemistry,	Soil chemist	**Explanation, presentation the model and lecture**	Exam
the secon	5	Ion exchar equations, physicochemic equations	Soil chemist	**Explanation, presentation the model and lecture**	Exam
the third	5	chemical equations, s anion exchar capacity	Soil chemist	**Explanation, presentation the model and lecture**	Exam
the fourth		Solubility balance in soil	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Fifth		Carbonate equilibrium, CO2-H2O system, CaCC H2O-CO2 system in soil	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Sixth	5	Phosphorus balance, ionization phosphorus soil, phospho reactions	soil chemist	**Explanation, presentation the model and lecture**	Exam
Seventh	5	Chemical potential of ic in the soil syst - soil solution	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Eighth	5	phosphorus dissolution	Soil chemist	**Explanation, presentation the model and lecture**	Exam

		Soil acidity a alkalinit			
Ninth	5	curves in Al2O3-Fe2O3- CaO-P2O5-H2 system	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Tenth	5	the importance studying degree of s reaction	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Eleventh	5	sources of acid in the so methods measuring acidity a alkalinity	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Twelfth	5	effect of degree reaction on cation exchan capacity.	Soil chemist	**Explanation, presentation the model and lecture**	Exam
Thirteent		Equilibrium curves, s buffering, acid	Soil chemist	**Explanation,presentation the model and lecture**	Exam
Fourteen		alkalinity ofso in dry and ser arid are calcareoussoils and gyps soils.	Soil chemist	**Explanation, presentation the model and lecture**	Exam

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, any)	Soil chemistry
Main references (sources)	Books related to the subject a

	scientific research
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://onlinelibrary.wiley.com/doi/full/10.1002/9781119 0762.wsts0025

Course Description Form

Course Name:	
24- **Soil fertility**	
Course Code:	
0025302	
Semester / Year:	
Second	
Description Preparation Date:	
3−9−2023	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Jaber Jassim Abu Talisha Email: **Jaberalardy@mu.edu.iq**	
Course Objectives	
Course Objectives	**The student gets to know the science of soil fertility** **• The student should classify the types of elements and their importance to plants** **• The student should detail the factors affecting nutrient readiness**

	• The student will be familiar with soil fertility evaluation **• The student should evaluate the soil elements according to the importance to plants**

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

Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
first	2	The student gets to know growth and the factors affecting it	**Fertilize technolo**	**Explanation, presentation of t model and lecture**	**the exam**
the secon	2	The student gets to know the types nutrients	Fertilizer technolog	**Explanation, presentation of t model and lecture**	**the exam**
the third	2	The student recognizes the movem and absorption of elements in the soi	Fertilizer technolog	**Explanation, presentation of t model and lecture**	**the exam**
the fourth	2	The student gets to know the types elements in the soil	Fertilizer technolog	**Explanation, presentation of t model and lecture**	**the exam**
Fifth	2	The student gets to know the necess elements	Fertilize technolo y	**Explanation, presentation of t model and lecture**	**the exam**
Sixth	2	The student gets to know the ma elements	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
Seventh	2	The student gets to know the small	**Fertiliz**	**Explanation,**	**the**

		elements	**technol y**	**presentation of t model and lecture**	**exam**
Eighth	2	The student gets to know the use and encouraging elements for growth	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
Ninth	2	For the student to recognize t distinction between elements	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
The tenth	2	**For the student to get to know Factors affecting the readiness elements**	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
Eleventh	2	The student gets to know nitrogen a its factors	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
Twelfth	2	The student gets to know phospho and potassium and their factors	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
Thirteenth	2	The student gets to know sulf calcium, magnesium, and tra elements	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
fourteenth	2	**The student will be familiar with t evaluation of soil fertility**	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**
Fifteenth	2	**The student will be familiar with t organic matter**	**Fertiliz technol y**	**Explanation, presentation of t model and lecture**	**the exam**

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

Learning and Teaching Resources	
Required textboo (curricular books, if any)	Soil fertility 2014/a. Dr. Nour El-Din Shawky Ali
Main references (source	Fertilizer technologies and uses, 2012, Prof. Dr. Nour El-D Shawqi Ali
Recommended books and references (scientific journals,	Iraqi academic scientific journals

reports...)	
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

Course Name:	
25- a desert environment	
Course Code:	
0025303	
Semester / Year:	
the second	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Presence	
Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/(2) units	
Course administrator's name (mention all, if more than one name)	
Name: Emad A.M.Aldahab Email:emad.aldahab@mu.edu.iq	
Course Objectives	
Course Objectives	**Learn about the des environment** **Factors leading to desertificatio**

	Desert patterns
Teaching and Learning Strategies	
Strategy	Strategy for the skill of thinking and making t appropriate decision, meaning that the student makes good decision when thinking about the desert environme and ways to overcome its negative effects

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first	2	Learn about the classification of deserts	classification of deserts	Attend	a daily test
the second	2	Learn about t geography deserts	geography deserts	Attend	a daily test
the third	2	Identify t climatic characteristics hot deserts	climatic characteristics hot deserts	Attend	a daily test
the fourth	2	Identify t relationship between rain a soil water conter	relationship between rain a soil water conter	Attend	a daily test
Fifth	2	First month exar	First month exar		
VI	2	Solve exercis related to t relationship between rain a soil water conte in the desert	relationship between rain a soil water conte in the desert	Attend	a daily test
Seventh	2	Recognizing dehydration	dehydration	Attend	a daily test

VIII	2	Identify dry regions and desertification	dry regions and desertification	Attend	a daily test
Ninth	2	Identify the patterns of dry regions and deserts	the patterns of d regions and deserts	Attend	a daily test
The tenth	2	Identify desert plants and their types	desert plants an their types	Attend	a daily test
eleventh	2	Second month exam	Second month exam		
twelveth	2	Learn about t ways desert pla adapt to the des climate	ways desert pla adapt to the des climate	Attend	a daily test
Thirteenth	2	Identify the changes in the desert and clima of Iraq	the changes in th desert and clima of Iraq	Attend	a daily test
fourteenth	2	Learn how develop the des environment	develop the des environment	Attend	a daily test
Fifteenth	2	Identifying t living patterns residents in t desert environment	living patterns o residents in the desert environment	Attend	a daily test

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

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

Electronic References, Websites	

Course Description Form

Course Name:
26- the economics of nature
Course Code:
0C15301
Semester / Year:
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)
Name: sadeq Hadi Hussein Email: Sadeq.hadi@mu.edu.iq
Course Objectives

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

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- Natural resource economics 2- Land economics 3- Oil 4- Water resources 5- Human resources 6- Environment 7- Public goods and external factors 8- General expenses 9- Public revenues 10- Preserving natural resources 11- Sources of		

			environmental pollution 12- Means of preserving natural resources		

Course Evaluation	
Natural Resource Economics - Hassoun Muhammad Ali	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Economics of Animal Production - Salem Tawfiq Al-Najafi - Mosul Press
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

13. Course Name:
Soil-Plant-Water
14. Course Code:
0025306
15. Semester / Year:
16. Description Preparation Date:

17. Available Attendance Forms:

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

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

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

20. 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

21. 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

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Soil properties , soil texture, soil composition and its relationship to plant growth	Soil-Plant-Water	Lecture	Quiz
2	4	Plant water requirements for evaporation and transpiration	Soil-Plant-Water	Lecture	Quiz
3	4	Efficiency of water use by plants	Soil-Plant-Water	Lecture	Quiz
4	4	Soil air and temperature	Soil-Plant-Water	Lecture	Quiz
5	4	Soil colloids	Soil-Plant-Water	Lecture	Quiz
6		exam			
7	4	Ion exchange and plant nutrient readiness	Soil-Plant-Water	Lecture	Quiz
8	4	Ionic transfer from soil to roots, soil solution	Soil-Plant-Water	Lecture	Quiz
9	4	Salt stress and its relationship to plant growth	Soil-Plant-Water	Lecture	Quiz
10	4	Nutritional stress and its relationship to plant growth	Soil-Plant-Water	Lecture	Quiz
11		exam			
12	4	water potential in the soil-plant-atmosphere system	Soil-Plant-Water	Lecture	Quiz
13	4	Micronutrients and their relationship to plant growth	Soil-Plant-Water	Lecture	Quiz

14	4	Biological activity in soil and its relationship to plant growth	Soil-Plant-Water	Lecture	Quiz
15		Comprehensive exam			

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

Course Description Form

Course Name:
27- Desertification
Course Code:
0015303
Semester / Year:
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)
Name: Dhafer Abdulrheem Shaker Email: :**dhaferabdshaker@mu.edu.iq**

Course Objectives	
Course Objectives	
Teaching and Learning Strategies	
Strategy	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			Introduction to the concept of desertification The problem of desertification, describing the forms of desertification and its causes The harms of desertification, its risks, and the losses resulting from it, desertification globally, Arably, and locally Origin of desertification. Vegetation, salinity, drought First month exam Combat Desertification. Agriculture and permaculture Water resources and combating desertification Sand dunes as a manifestation of desertification Area distribution of sand dunes locally and their spread globally. The origin of the sand dune problem. Sand dunes and sand dunes. Means and methods		

			for measuring desertification and sand dunes Second month exam Erosion measurement. Measuring the ability of soil to be removed. Measuring loss and addition Drought and aridity Global Warming Water harvesting		

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

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

Course Description Form

Course Name:
28- **Soil physics**
Course Code:
0015305
Semester / Year:
THIRD
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Actual presence
Number of Credit Hours (Total) / Number of Units (Total)

2 theoretical 3 practical units 3.5

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

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

Course Objectives

Course Objecti	**1- Researches the study of soil physics and the physical properties of soil** **2- Study how to measure the physical properties of soil** **3- Applying measurements of physical properties to solve scientific problems related agriculture and the environment** **4- Understanding the relationship between physical soil properties** **5- Knowing the movement of water in the soil and the flow of water in saturated and unsaturated soils.**

Teaching and Learning Strategies

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	**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**	**Soil physics**	**Explanation, presentation of**	**the exam**

		physically and chemically		model and lecture	
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, 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

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (curricu	1- Soil Physics, written by Dr. Hisham Mahmoud Hassan 200 2- Basics of soil physics, translation. Mahdi Ibrahim Odeh 19

books, if any)	
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

Course Name:	
29- **remote sensing**	
Course Code:	
0025304	
Semester / Year:	
THIRD	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Dr. AULA HUSSEIN ALI Email: Aula.alobeidi@mu.edu.iq	
Course Objectives	
Course Objecti	**1- 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**

	satellite images **4- Studying methods for classifying satellite images** **5- The student's knowledge of geographic information systems (GIS) and their uses**

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	**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 electromagn 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**	**the exam**

				model and lecture	
Ninth	4	**Types and characteristics sensors**	**remote sensing**	**Explanation, presentation of model and lecture**	**the exam**
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**

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

Learning and Teaching Resources	
Required textbooks (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

Course Name:	
30- **Design and analysis experiments**	
Course Code:	
0C15302	
Semester / Year:	
THIRD	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Hadi Awad hasony Email: hadi_habeb2000@mu.edu.iq	
Course Objectives	
Course Objecti	**1* Informing the student that there are areas that depend on conducting experiments, an these experiments must be designed on scientific foundations** *** When analyzing experiments, it is done according to scientific methods and logical ste** *** Upon obtaining accurate results of the experiment, it leads us to make the appropriate decision** *** Introducing the student to many types of designs, as each experiment has a specific design** *** Introducing the student to how to test the significance of each mathematical model** *** Informing the student that there are tests conducted before the experiment and tests proposed after the experiment** *** Informing the student that there are values that can be lost during the experiment a that they can be estimated**

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	4	A historical overview of statistics, definition of statistics,		**Explanation, presentation of model and lecture**	**the exam**
the secon	4	division of statistics Measures of central tendency, measures of centralization		**Explanation, presentation of model and lecture**	**the exam**
the third	4	Measures of dispersion		**Explanation, presentation of model and lecture**	**the exam**
the fourth	4	Hypothesis testing, statistical errors, hypothesis t-test		**Explanation, presentation of model and lecture**	**the exam**
Fifth	4	Chi-square test		**Explanation, presentation of model and lecture**	**the exam**
Sixth	4	General concepts and definitions in designing and analyzing experiments,		**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	Types of agricultural experiments, complete randomized design		**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	lsd test		**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	Randomized complete block design		**Explanation, presentation of**	**the exam**

				model and lecture	
The tenth	4	Duncan's test		**Explanation, presentation of model and lecture**	**the exam**
Eleventh	4	Latin square design		**Explanation, presentation of model and lecture**	**the exam**
Twelfth	4	Global experiments		**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	Factorial experiments with two factors		**Explanation, presentation of model and lecture**	**the exam**
fourteent	4	Factorial experiments with three factors		**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4	Correlation and simple lin regression		**Explanation, presentation of model and lecture**	**the exam**

Course Evaluation

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

Learning and Teaching Resources

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

Course Description Form

Course Name:
31- English course
Course Code:
U015301
Semester / Year: Semester
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
2hours weekly
Course administrator's name (mention all, if more than one name)
Name: Lafta Awad Atshan Email: lafta.awad@mu.edu.iq
Course Objectives

Course Objectives	**English language skills**

Teaching and Learning Strategies	
Strategy	

Course Structure

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

1 2 3 4 5 6 7 8 9 10 11 12	2 2 2 2 2 2 2 2 2 2 2 2		Sentences strictures Past tense Past simple Past continuous Present tenses Present Simple Present continuous Future tense Future simple Paragraphs writing Paragraphs writing Paragraphs writing		

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

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Cambridge English: Preliminary
Recommended books and references (scientific journals, reports…)	Cambridge English: Preliminary
Electronic References, Websites	An English videos

Course Description Form

Course Name:
32- **Irrigation**
Course Code:
0025301
Semester / Year:

second

Description Preparation Date:

3-9-2023

Available Attendance Forms:

Actual presence

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

2 theoretical 3 practical units 3.5

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

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

Course Objectives

Course Objecti	**1- Researches the science of irrigation, its sources, methods of controlling it, exploiting and delivering it to agricultural fields** **2- Study to evaluate the quality of irrigation water and its suitability for irrigation.** **3- Know how to plan, design and implement irrigation facilities** **4- It examines the relationship of water with soil, the movement of water in the soil, a the flow of water** **5- Calculating plant water consumption, water requirements, and irrigation scheduling addition to irrigation water measurements** **6- It examines drainage, sources of excess water, and the relationship of drainage to pla growth and productivity, soil salinity, salt balance, and washing requirements.**

Teaching and Learning Strategies

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	4	The concept of irrigation, sources irrigation water, physical characteristics related to irrigation	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
the secon	4	Irrigation water quality	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
the third	4	The relationship of water with soil - moisture, movement of water in the s	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
the fourth	4	Irrigation water measurements	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Fifth	4	Plant water consumption, water needs and irrigation scheduling	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Sixth	4	Transport and distribution of irriga water, movement of water in pipes open channels	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Seventh	4	Adequacy and efficiency of irriga and consistency of irrigation	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Eighth	4	Traditional irrigation methods	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Ninth	4	Modern irrigation methods	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
The tenth	4	Drainage concept, sources of ex water	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	4	The relationship of drainage to p growth and productivity	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	4	Drainage, soil salinity, leach requirements and salt balance	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	4	Types of drains: open, covered	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
fourteent	4	Distribution patterns of the d network, distance between drains maintenance of drains	Irrigation and drainage	**Explanation, presentation of model and lecture**	**the exam**
Fifteenth	4		Irrigation and drainage	**Explanation, presentation of**	**the exam**

				model and lecture	

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

Learning and Teaching Resources	
Required textbooks (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- 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)	1-Irrigation, its basics and applications, written by Dr. Nabil Ibrahim Al-Taif and Dr. Issam Khudair Hamza Al-Hadithi 198 Ministry of Higher Education and Scientific Research - University of Baghdad 2- 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 Hamza Al-Hadithi, 2010, Ministry of Higher Education and Scientific Research - Anbar University 3- Irrigation and drainage, written by Dr. Laith Khalil Ism 2000 Ministry of Higher Education and Scientific Researcl University of Msul
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals
Electronic Referenc Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

Course Name:	
33-	**Plant Physiology**
Course Code:	
0015302	
Semester / Year:	
Second	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical	3 practical units 3.5
Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. jabir jasim abwtlisha Email: Jaberalardy@mu.edu.iq	
Course Objectives	
Course Objectives	**• The student gets to know Plant Physiology** **• The student should classify of cells** **• The student should detail the benefits and harms of Metabolism , Respiration ,Transpiration** **• The student should know about plant hormones**
Teaching and Learning Strategies	
Strategy	1-Explanation and clarification 2- Lecture method 3- Student groups

	4- Practical lessons 5- Scientific trips 6 - Self-learning method

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	2		**Plant Physiology**	Components a plant cell	**the exa**
the second	2		Plant Physiology	**Osmosis**	**the exa**
the thi	2		Plant Physiology	Past a active absorption	**the exa**
the fourth	2		Plant Physiology	Photosynthe	**the exa**
Fifth	2		Plant Physiology	**Respiration**	**the exa**
Sixth	2		Plant Physiology	**Growth p Hrmons**	**the exa**
Seven	2		Plant Physiology	Inhibitors p Hermon's	**the exa**
Eighth	2		Plant Physiology	Enzymes	**the exa**
Ninth	2		Plant Physiology	**Transpiration**	**the exa**
The tenth	2		Plant Physiology	Guttation a blooding	**the exa**
Elever	2		Plant Physiology	**Colloidal solution**	**the exa**
Twelft	2		Plant Physiology	**Vernilazation**	**the exa**

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

Course Description Form

25. Course Name:
Hydrology
26. Course Code:
0015301
27. Semester / Year:
SEMESTER
28. Description Preparation Date:
3-9-2023
29.Available Attendance Forms:
30.Number of Credit Hours (Total) / Number of Units (Total)

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

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

32. 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.

33. 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.

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Hydrological cycle	Hydrology	Lecture	Quiz
2	4	Precipitation Evaporation Losses from precipitation	Hydrology	Lecture	Quiz
3	4	Run off and infiltration	Hydrology	Lecture	Quiz
4	4	Factors affecting surface runoff	Hydrology	Lecture	Quiz
5	4	Types of Stream	Hydrology	Lecture	Quiz
6	4	Floods and its effects	Hydrology	Lecture	Quiz
7	4	Store water and reduce the effects of drought	Hydrology	Lecture	Quiz
8	4	Water budget	Hydrology	Lecture	Quiz
9	4	Hydrograph	Hydrology	Lecture	Quiz
10	4	Water reservoirs	Hydrology	Lecture	Quiz
11	4	Groundwater, sources of groundwater recharge	Hydrology	Lecture	Quiz

12	4	Groundwater movement	Hydrology	Lecture	Quiz
13	4	Wells and the factors that must be taken into account when drilling	Hydrology	Lecture	Quiz
14	4	Flow monitoring	Hydrology	Lecture	Quiz
15	4	The Applications of remote sensing in monitoring groundwater	Hydrology	Lecture	Quiz

35. 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

36. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Applied Hydrology Ray K. lensley et.al New York, USA
Main references (sources)	
Recommended books and references (scientific journals, reports…)	International Journal of Hydrology Science and Technology
Electronic References, Websites	

Course Description Form

Course Name:
34- Soil water plant and analysis
Course Code:
0015304
Semester / Year: Chapter Two/Four
Description Preparation Date:
3−9−2023
Available Attendance Forms:
Actual presence
Number of Credit Hours (Total) / Number of Units (Total)

2 theoretical 0 practical units 2

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

Name: Prof. Dr. G. B. Noni
Email: ghanem-bahlol@mu.edu.iq

Course Objectives

Course Objectives	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

Teaching and Learning Strategies

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

Course Structure

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

The seco	5	is for the student to know analytical of water			
Third	5	The student learns about soil analytical	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam
Fourth	5	The student gets to know plant analytical	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam
Fifth	5	: The student learns about methods of soil samples	Water , soil plant analytical	Explanation, presentation of the model and 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 pl analytica	Explanation, presentation of the model and lecture	the exam
Eighth		The student gets to know the quantitative and volumetric methods	Water , and pl analytica	Explanation, presentation of the model and lecture	the exam
Ninth		The student gets to know the quantitative and weighing methods	Water , and pl analytica	Explanation, presentation of the model and lecture	the exam
Tenth		: The student will learn about electrical of a Analytical methods	Water , and pl analytica	Explanation, presentation of the model and lecture	the exam
Eleventh Twelfth	5	The student gets to know About analytical of spectroscopy The student gets to	Water , and pl analytica	Explanation, presentation of the model and lecture	the exam the exam

		know Atomic emission methods			
th e h		: The student knows how the Atomic absorption methods	Water , and pl analytica	Explanation, presentation of the model and lecture	the exam
Fourteen		: The student gets to know Metal analysis methods	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam
Fifteenth		The student gets to know the types of X-ray analysis methods	Water , soil plant analytical	Explanation, presentation of the model and lecture	the exam

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

Forth stage

Course Description Form

Course Name:
35- Soil salinity and its melioratio
Course Code:
0025401
Semester / Year:
Semester
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Attend
Number of Credit Hours (Total) / Number of Units (Total)
4 3

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

Name: Assistant Professor Dr. bashar mezher jader
Email: bashar_mezher@mu.edu.iq

Course Objectives

Course Objectives	**It investigates the spread of saline soils in the world and Iraq a its impact on agricultural production. It includes studying sources of salts in nature and soils and means of transport them, studying the effect of salts on plant growth and metho for increasing plants' resistance to salinity.**

Teaching and Learning Strategies

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	5	The problem of salinity and impact onagriculturalproduction, problem of salinity in Iraq in past and present	Salinity and l reclamation	Explanation presentation the model a lecture	exam
second	5	Sources of salt components	alinity and l reclamation	Explanation presentation the model a lecture	Exam
third	5	The effect of soil salinity on plant	Salinity and l reclamation	Explanation presentation the model a lecture	Exam
the fourt	5	Classification and naming of s affected by salts	Salinity andl reclamation	Explanation presentation the model a lecture	Exam
Fifth	5	Irrigation water quality	alinity and l reclamation	xplanation, presentation the model a lecture	Exam

Sixth	5	Controlling salinity and ways to l with it	Salinity and l reclamation	Explanation presentation the model lecture	Exam
Seventh		Land reclamation (decisions requirements).	Salinity and l reclamation	Explanation presentation the model lecture	Exam
E h		Lands that need reclamation	Salinity andl reclamation	Explanation presentation the model lecture	Exam
Ninth	5	Reclamation of salty lands	Salinity and l reclamation	Explanation presentation the model lecture	Exam
Tenth	5	Reclamation of sandy lands	Salinity and l reclamation	Explanation presentation the model lecture	Exam
Eleventh	5	Gypsum lands and their reclamati	Salinity and l reclamation	Explanation presentation the model lecture	Exam
Twelfth		Limestone lands and th reclamation	Salinity and l reclamation	Explanation presentation the model lecture	Exam
Thirteent	5	Waterlogged lands and th reclamation	Salinity and l reclamation	Explanation presentation the model lecture	Exam
fourteent		Desert lands and their reclamatior	Salinity and l reclamation	Explanation presentation the model lecture	Exam

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil salinity Soil melioration
Main references (sources)	Books related to the subject a scientific research

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://www.sciencedirect.com/tops/earth-and-planetary-sciences/soil salinity

Course Description Form

Course Name:
36- **Soil microbiology**
Course Code:
0015405
Semester / Year:
four
Description Preparation Date:
3-9-2023
Available Attendance Forms:
Actual presence
Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 3 practical units 3.5
Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. G. B. Noni Email: ghanem-bahlol@mu.edu.iq
Course Objectives

Course Objecti	**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**

Teaching and Learning Strategies

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	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 fourtl	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	Soil	Explanation,	the exam

		sulfur cycle, mineralization, microl metabolism, oxidation, and reduction inorganic sulfur compounds.	**Microbiolog**	**presentation of model and lecture**	
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**

Course Evaluation

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

Learning and Teaching Resources

Required textbooks (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**

Course Description Form

Course Name:
37- Environmental stress
Course Code:
0015407
Semester / Year: Fourth
23-2024
Description Preparation Date:
3-9-2023
Available Attendance Forms: In person + electronic
Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 75 hours
Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Muhammad Radwan Mahmoud Email: modrn@mu.edu.iq
Course Objectives

Course Objectives **Course objectives** **Objectives of the study subject This cou description provides a summary of the n important characteristics of the course and learning outcomes that the student is expected achieve, demonstrating whether he or she has m the most of the learning opportunities available must be linked to the program description**	**he student will be familiar with the mechanism of ct of environmental stress on plants, and the forms effect** **troducing the student to the environmental str lting from extreme conditions and its effects on plar plants resist that effect, and what the damag lting from that effect are**

Teaching and Learning Strategies	
Strategy	**Strategic teaching and learning methods** **Audio methods (teaching explanation of the topic)** **Style of writing on the blackboard** **The method of direct dialogue between the teacher and the student, with**

	student's evaluation in class participation **Conduct experiments.**

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first week	**2Theoretic** **3 Practica**		**An introduction to the type stress** **Stress measurement methods**		**Exams , reports, discussions**
second week	**2Theoretic** **3 Practica**		**Mechanism of the effect of st on metabolism** **)construction and demolition** **Stress simulation methods**		**Exams , reports, discussions**
the third week	**2Theoretic** **3 Practica**		**Water stress** **The movement of water in the plant at** **The occurrence of water tens**		**Exams , reports, discussions**
fourth week	**2Theoretic** **3 Practica**		**The effect of water stress on Physiological processes** **Anatomical compari between plants** **Stress-prone plants** **Water balanced**		**Exams , reports, discussions**
The fifth week	**2Theoretic** **3 Practica**		**The effect of water stress on:** **Metabolic components** **Morphological compari between** **Plants exposed to stress** **And balanced plants**		**Exams , reports, discussions**
the sixth week	**2Theoretic** **3 Practica**		**Divide plants according to t needs** **waterproof,** **Plants adapt to water stress** **Anatomical features** **The morphology of plants** **Drought resistance**		**Exams , reports, discussions**
Sevent h week	**2Theoretic** **3 Practical**		**Hardening, the effect of soil darkening the plants** **Practical experiments on hardening** **And the darkening of the soil**		**Exams , reports, discussions**

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

Course Evaluation		
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc		
Learning and Teaching Resources		
Required textbooks (curricular books, if any)		
Main references (sources)	Matthew, A.J and P. M. Hasegawa (2003). Plant Abiotic Stress. 2nd Edition. Wily Pub. PP: 336. Shabala S. (2017). Plant Stress Physiology. 2nd Edition. CABI Pub. PP: 376	صادر 2(
Recommended books and references (scientific journals, reports...)	Iraqi -reviewed journals **/https://www.elsevier.com**	
Electronic References, Websites	**/https://www.elsevier.com** **/https://scholar.google.com**	

Course Description Form

Course Name:
38− Geographic information systems
Course Code:
0015404
Semester / Year:
urth
Description Preparation Date: 2023-2024
3−9−2023
Available Attendance Forms: In person + electronic
Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 75 hours
Course administrator's name (mention all, if more than one name)
Name: assi. Prof. Dr. ali Fadhil Email: alifadhil@mu.edu.iq
Course Objectives
General objectives: Introducing students to the general concepts of geographical technologies, a number of programs used, and introducing them to a number of concepts of the educational process and applications rela

to them.
Specific objectives: The student should be able to:
1. Knowledge of the basic foundations and principles of geographical techniques and their methods, tools and techniques.
2. Knowing the practical application process, its impact, and its relationship to the educational material.
3. Know the importance of geographic techniques in preparing digital maps.
4. Knowledge of the historical background for the development of geographical techniques and the scientific methods and methods associated with them.
5. Know the importance of geographical techniques in preparing agricultural research.
6. Applying the scientific concepts the student has learned in his practical life.
In addition to working on achieving the six levels (remembering - understanding - application - analysis - synthesis - evaluation).
In presenting the learning material by following multiple methods and methods.

Teaching and Learning Strategies

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

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first week	**2Theoretic 3 Practica**		Introduction to geographi technologies (the concept technologies, th importance, types. T complementary relations between geographi technologies)		**Exams , reports, discussions**
second week	**2Theoretic 3 Practica**		Remote sensing (understo (definition), its histor development. Its importa and areas of its gene applied uses.		**Exams , reports, discussions**
the third week	**2Theoretic 3 Practica**		Types of remote sensing and its techniques		**Exams , reports, discussions**

fourth week	**2Theoretic 3 Practica**		Google Earth applicati (definition, contents)		**Exams , reports, discussions**
The fifth week	**2Theoretic 3 Practica**		How to improve space visualization (bands, various operations on space visualization		**Exams , reports, discussions**
the sixth week	**2Theoretic 3 Practica**		Geographic Informat Systems (GIS) (introduct to information syste understanding (nature of currency), definiti features)		**Exams , reports, discussions**
Sevent h week	**2Theoretic 3 Practical**		Components of geographi information systems		**Exams , reports, discussions**
The eighth week			Types of data and information in geographic information systems (spat data).		
Week nine	**2Theoretic 3 Practical**		Data Descriptive and temporal data		**Exams , reports, discussions**
The tenth week	**2Theoretic 3 Practical**		Databases in geographic information systems and their types		**Exams , reports, discussions**
Week eleven	**2Theoretic 3 Practical**		Structure and installation databases in geographic information systems		**Exams , reports, discussions**
The twelfth week	**2Theoretic 3 Practical**		A practical lesson on how create databases in geographic information systems		**Exams , reports, discussions**
The thirtee nth week	**2Theoretic 3 Practical**		Applications of Arc GIS 1 (definition, contents, (displ window, tables, layout, scripts))		**Exams , reports, discussions**
The fourtee nth week	**2Theoretic 3 Practical**		Working with the scene or display window (opening t project, zooming in and ou of features, moving them, showing, hiding, arranging activating topics)		**Exams , reports, discussions**
			Dealing with the charts window (creating it, editin it, displaying it)		

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:	
39- Professional ethics	
Course Code:	
U025401	
Semester / Year:	
2023 – 2024	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
One hour per week on Semester	
Course administrator's name (mention all, if more than one name)	
Name: Prof.Dr.Falah Hasan Issa Email: flah70-hasan@mu.edu.iq	
Course Objectives	
Course Objectives	Creating a community prepared to deal with the la market • Knowledge of general work ethics • Knowledge of rights and duties at work
Teaching and Learning Strategies	
Strategy	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			1- The concept of wor ethics 2- The importance of ethics in general 3- The importance of ethics for the individu 4- The importance of ethics for society 5- Ethics required in t employer 6- The decline in work ethics 7- Patterns of behavio and ethics at work 8- Types of corruptio according to the field which it arose 9- Corruption accordi to the affiliation of the individuals involved i corruption 10- Manifestations of administrative and financial corruption 11- The ethics of the teaching profession a its impact on the educator's personality and performance 12- Sources of ethics i the teaching professio 13- The in characteristics that be present in the educ		

Course Evaluation

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

Learning and Teaching Resources

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

Course Description Form

Course Name:	
40- Water Quality	
Course Code:	
0015401	
Semester / Year:	
Semester	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Attend	
Number of Credit Hours (Total) / Number of Units (Total)	
4	3
Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Dr. bashar mezher jader Email: bashar_mezher@mu.edu.iq	
Course Objectives	
Course Objectives	**The course describes the concept of hydrol and the hydrological and hydrological cycle. scientific terms used in the field of water scie are also discussed. In this course, the stud learns about the partial structure of water and natural and chemical properties. The flow of flu in open pipes and channels in porous media also explained and interpreted.**
Teaching and Learning Strategies	
Strategy	• Make the learner active and effective in educatio situations. • Teach students to respect different opinions and val

	others • Benefit from other people's ideas and information.

Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
first	5	Water properties	Water quality	**Explanation, presentation the model a lecture**	Exam
the second	5	Irrigation water qual in Iraq	Water quality	**Explanation, presentation the model a lecture**	Exam
the third	5	Irrigation water classificati systems	Water quality	**Explanation, presentation the model a lecture**	Exam
the fourth	5	Approved indicators evaluating irrigation water quali	Water quality	**Explanation, presentation the model a lecture**	Exam
Fifth	5	Suitability irrigation water	Water quality	**Explanation, presentation the model a lecture**	Exam
Sixth	5	Irrigation water quali	Water quality	**Explanation, presentation the model a lecture**	Exam
Seventh	5	The role irrigation water a salt balar in the soil	Water quality	**Explanation, presentation the model a lecture**	Exam
Eighth	5	Water Pollution	Water quality	**Explanation, presentation the model a lecture**	Exam
Ninth	5	Water	Water quality	**Explanation,**	Exam

		desalinatio		**presentation the model a lecture**	
Tenth	5	Water harvesting	Water quality	**Explanation, presentation the model a lecture**	Exam
Eleventh	5	The relationshi between irrigation water quality, agricultura yield, soil a climate	Water quality	**Explanation, presentation the model a lecture**	Exam
Twelfth	5	The relationshi between irrigation water qual and irrigation technologie	Water quality	**Explanation, presentation the model a lecture**	Exam
Thirteenth	5	Technologi for using s water irrigation	Water quality	**Explanation, presentation the model a lecture**	Exam
Fourteenth	5	Wastewate and techniques for its s use irrigation	Water quality	**Explanation, presentation the model a lecture**	Exam

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Water quality

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

Course Description Form

Course Name:
41- sustainable development
Course Code:
0015402
Semester / Year: Chapter Two/Four
Description Preparation Date:
3−9−2023
Available Attendance Forms:
Actual presence
Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical 0 practical units 2
Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Jaber Jassim Abu Talisha Email: **Jaberalardy@mu.edu.iq**
Course Objectives

Course Objectives	For the student to know the

	types of sustainable development • The student should classify 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

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

Course Structure

Week	**Hours**	**Required Learning**	**Unit or**	**Learning**	**Evaluati**

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

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

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

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

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals

Electronic References, Websites	**Soil Science Society Of America** **Library Genesis**

Course Description Form

Course Name:
42- Basics of livestock production
Course Code:
0025402
Semester / Year:
the second 2024
Description Preparation Date
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total) 30(3 unit)
Course administrator's name (mention all, if more than one name)
Name: Hassan Awied Fazaa Email: hassanawied@mu.edu.iq

Course Objectives

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

Teaching and Learning Strategies

Strategy	

Course Structure

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

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

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	*Principles of animal production *Basics of livestock production
Main references (sources)	-The basics of sheep and goat production, Dr. Jalal Elia Al-Qass 2- Milk cattle production, Dr. Naguib Tawfiq
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

Course Name:
43- Wind and water erosion
Course Code:
0025404
Semester / Year:
Description Preparation Date:
3-9-2023
Available Attendance Forms:

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

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

Name: Dhafer Abdulrheem Shaker
Email: :dhaferabdshaker@mu.edu.iq

Course Objectives

Course Objectives	

Teaching and Learning Strategies

Strategy	

Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
			Mechanics and processes of wind and water erosion Wind erosion Water erosion Erosion and its impact on human activities First month exam Runoff Soil erosion and its types Methods of controlling soil erosion Environmental problems related to soil degradation The impact of soil maintenance on its sustainable productivity Second month exam The concept of non-erodible soil aggregates Sand dunes Windbreaks		

			Small earth dams and water reservoirs		

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

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

Course Description Form

Course Name:
44- Groundwater management
Course Code:
0015403
Semester / Year:
the first
Description Preparation Date:
1/9/2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
Course administrator's name (mention all, if more than one name)
Name: Dhafer Abdulrheem Shaker Email: dhaferabdshaker@mu.edu.iq
Course Objectives

Course Objectives	**• Identify the foundations of wind and water**

	erosion. **• Identify the impact of erosion on human activities.** **• Identify the danger of erosion on agricultural lands.** **• Compare and differentiate between wind eros and water erosion.**

Teaching and Learning Strategies

Strategy	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first	2	Identify the impact of soil maintenance on its sustainable productivity	the impact of soil maintenance on its sustain productivity	Attend	a daily test
the second	2	Identify the concept of non-erodible soil aggregates	the concept of non-erodible aggregates	Attend	a daily test
the third	2	Identify sand dunes	sand dunes	Attend	a daily test
the fourth	2	Identify windbreaks	windbreaks	Attend	a daily test
Fifth	2	Identify small earth dams and water reservoirs	small earth dams and water reservoirs	Attend	a daily test
VI	2	Identify erosion and weathering of groundwater	erosion and weathering of groundwater	Attend	a daily test
Seventh	2	Learn about the conservation and maintenance of soil and water	the conservation and maintenance of soil and water	Attend	a daily test
VIII	2	Identify wind erosion	wind erosion	Attend	a daily test
Ninth	2	Identify water erosion	water erosion	Attend	a daily test

The tenth	2	Identify erosion and its impact on human activities	erosion and its impact on human activities	Attend	a daily test
eleventh	2	Identify surface runoff	surface runoff	Attend	a daily test
twelveth	2	Identify soil erosion and its types	soil erosion and its types	Attend	a daily test
Thirteent	2	Identify methods of controlling soil erosion	methods of controlling soil erosion	Attend	a daily test
fourteent	2	Identify environmental problems related to soil degradation	environmental problems related to soil degradation	Attend	a daily test
Fifteenth	2	Identify the mechanics and proces of wind and water erosion	the mechanics and process of wind and water erosion	Attend	a daily test

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	**Water and wind erosion and its impact on lands.** **Written by: Dr. Dhafer Ibrahim Al-Azzawi, Dr. Ismail Fadel Al Bayati**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

Course Name:
45– English course
Course Code:
U015401
Semester / Year: Semester

Description Preparation Date:
3-9-2023
Available Attendance Forms:
Number of Credit Hours (Total) / Number of Units (Total)
2hours weekly
Course administrator's name (mention all, if more than one name)
Name: Lafta Awad Atshan Email: lafta.awad@mu.edu.iq

Course Objectives	
Course Objectives	**English language skills**

Teaching and Learning Strategies	
Strategy	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Sentences strictures		
2	2		Past tense		
3	2		Past simple		
4	2		Past continuous		
5	2		Present tenses		
6	2		Present Simple		
7	2		Present continuous		
8	2		Future tense		
9	2		Future simple		
10	2		Paragraphs writing		
11	2		Paragraphs writing		
12	2		Paragraphs writing		

Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily

preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Cambridge English: Preliminary
Recommended books and references (scientific journals, reports…)	Cambridge English: Preliminary
Electronic References, Websites	An English videos

Course Description Form

Course Name:	
46- Desert soil management	
Course Code:	
0025403	
Semester / Year:	
23-2024	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Attendance	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theory/ 4 practical / 3 units	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Saleh Shehab Sabah Email: saleh.sabah79@mu.edu.iq	
Course Objectives	
Course Objectives	• Identify the types of oil soils • How to deal with these soils • Achieving maximum focus on the relationship of effective oil soils to growing crops in them • Develop an agricultural plan that prevents accumulated climate damage and poor soil management • Determine the location of the soil and the direction of the winds to place windbreaks and influence winds and floods
Teaching and Learning Strategies	

Strategy	1- Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons in agricultural fields 5- Scientific trips to relevant departments and research stations 6- Self-learning method

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	6	Learn about desert soil management, definitions and terms	Related to soil management	Presence	Daily test
second	6	Identify the components of the desert environment	Components of the desert environment	Presence	Daily test
third	6	Learn about soil surveying and management	Soil surveying and management	Presence	Daily test
fourth	6	Learn about the mechanism of land use evaluation	The mechanism of land use evaluation	Presence	Daily test
Fifth	6	Identify the soil classification mechanism	Soil classification mechanism	Presence	Daily test
Sixth	6	Identify the suitability of soil for growing crops and vice versa	Suitability of soil for growing crops and vice versa	Presence	Daily test
Seventh	6	Learn about the agricultural cycle application	Learn about the agricultural cycle application	Presence	Daily test
Eighth	6	Get to know the	The	Presence	Daily test

		administrative map	administrative map		
Ninth	6	Identify the legal description of the land's location	The legal description of the land's location	Presence	Daily test
Tenth	6	Identify the Reclamation procedures	Reclamation procedures	Presence	Daily test
Elevent	6	Identify civilian units	Civilian units	Presence	Daily test
Twelve	6	Learn about climate problems	Climate problems	Presence	Daily test
Thirtee	6	Identify the risks of erosion	The risks of erosion	Presence	Daily test
fourtee	6	Identify the most important desert plants	Most important desert plants	Presence	Daily test
Fifteent	6	Studying the effect of root systems on soil properties	Effect of root systems on soil properties	Presence	Daily test

Course Evaluation

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

Learning and Teaching Resources

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

Course Description Form

Course Name:	
47- **Soil survey and classification**	
Course Code:	
0025407	
Semester / Year:	
Fourd	
Description Preparation Date:	
3-9-2023	
Available Attendance Forms:	
Actual presence	
Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical 3 practical units 3	
Course administrator's name (mention all, if more than one name)	
Name: aula saad rasool Email : aula.abokehella @mu.edu.iq	
Course Objectives	
Course Objecti	**Soil classification systems in the world** ● **The old system of soil classification** ● **The modern quantitative system for soil classification** ● **Rules and organizational structure**
Teaching and Learning Strategies	
Strategy	1-Explanation and clarification 2- Lecture method 3- Student groups 4- Practical lessons 5- Scientific trips 6 - Self-learning method

Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
first	2	**The student gets to know the concept of Classification**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
the secon	2	**For the student to know the metheds of Soil Classification**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
the third	2	**The student will be familiar with the means of Formation soil**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
the fourth		**The student will be familiar with the I Soil survey**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Fifth	2	**The student will be familiar with the conditions of soil formation**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Sixth	2	**student gets to know the types Rocks**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Seventh	2	**For the student to recognize the aspects the earth systems**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Eighth	2	**The student will be familiar with the indicators for determining the effect of Geology**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Ninth	2	**The student will be familiar with the means of increasing the ability of Fiel survvey**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
The tenth	2	**The student will be familiar with the factors determining the quality of irrigation water and the indicators used determine the quality of irrigation wate**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Eleventh	2	**The student will be familiar with irrigati water classification systems**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Twelfth	2	**The student will learn Fao classificatio**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**
Thirteent	2	**For the student to become familiar with**	**Soil survey**	**Explanation,**	**the exam**

		problems of limestone soils	**classification**	**presentation of model and lecture**	
fourteent	2	**The student will be familiar with the means of increasing the ability of plants tolerate salinity**	**Soil survey classification**	**Explanation, presentation of model and lecture**	**the exam**

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

Learning and Teaching Resources	
Required textbooks (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**