



**Republic of Iraq Ministry of Higher Education &
Scientific Research**

Northern Technical University

NTU Technical Agricultural College/ Mosul TAC

Department of Desertification Control Technology

MODULE DESCRIPTION FORM

Module Information				
Module Title	Scientific research methodology		Module Delivery	
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	TAMO400			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level		4 th level	Semester of Delivery	7
Administering Department		Department of Desertification Control Technology	College	Technical Agricultural College
Module Leader	Ahmed Faris Salim		e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor	Omar ahmed fathi		e-mail	omar.ah.f@ntu.edu.iq
Peer Reviewer Name			e-mail	

Relation with other Modules			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The student is trained in clear scientific thinking, how to make scientific explanations and apply them in the field, and how to take readings and arrive at a logical analysis of the results.
Module Learning Outcomes	- The student will be able to develop a research plan on any scientific topic, apply it, take the results, analyze them statistically, and give a scientific discussion of the results obtained from the research.

Indicative Contents	Part A - Theoretical part Modern scientific method. The beginning of scientific theory and its steps. The assumptions on which the scientific method is based in dealing with natural phenomena. Basic characteristics of scientific research. Characteristics of a successful researcher. Types of research and its applications. Scientific research institutions. Basis for choosing the problem. Exploratory readings and reviews of previous research. Formulating research hypotheses.
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Learning and Teaching Strategies

Strategies	- The student will be able to think scientifically about solving any problem, develop a strategy to conduct research and investigate scientific facts to solve the problem, take data, analyze it logically, and come up with recommendations to address the problem.
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Student Workload (SWL)

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.33
Total SWL (h/sem)	50		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Modern scientific method
Week 2	The beginning of scientific theory and its steps
Week 3	The assumptions on which the scientific method is based in dealing with natural phenomena.
Week 4	Basic characteristics of scientific research.
Week 5	Characteristics of a successful researcher.
Week 6	Types of research and its applications,
Week 7	Scientific research institutions,
Week 8	Basis for choosing the problem
Week 9	Methods of presenting information
Week 10	Discussing research
Week 11	Publishing research
Week 12	Introduction to the Internet and its uses
Week 13	Exploratory readings and reviews of previous research,
Week 14	Formulating research hypotheses,
Week 15	Full review

Delivery Plan (Weekly Lab. Syllabus)

week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Lectures on scientific research methodology / Professor Dr. Iyad Youssef Al-Haj Ismail / 2019	Yes
Recommended Texts		No
Websites		

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

MODULE DESCRIPTION FORM

Module Information			
Module Title	Crop growth Modeling	Module Delivery	
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
Module Code	DES 400		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4 th level		
Semester of Delivery			
Administering Department		College	Technical Agricultural College
Module Leader	Ahmed Faris Salim	e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Omar ahmed fathi	e-mail	omar.ah.f@ntu.edu.iq

Relation with other Modules			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	Teaching the student the foundations and principles of producing forage and pasture crops and their impact on agricultural livestock.
Module Learning Outcomes	The student will be able to know:- 1- Preparing and preparing the land for cultivation. 2- Cultivation and service of fodder crops. 3- The appropriate stage for cutting plants and presenting them to animals. 4- Exploiting natural pastures and methods of improving them. 5- Preparation of feed mixtures.
Indicative Contents	Indicative content includes the following. Part B-practical part: *A general evaluation of coarse and concentrated plant feed materials. The nutritional value of plant feed materials. * Studying the phenotypic appearance and diagnosing the seeds of the following crops: barley, oats, Sudanese grass, millet, white and yellow corn, beans, jet, clover, and hartman, preparing the soil, amending the panels designated for planting. *Cultivation of the views field with fodder crops.

Learning and Teaching Strategies

Strategies	1- The necessity of visiting to gain experience from others. 2- Obtaining new scientific information in the field of scientific research (videos). Practical training in the field. 3- Access to modern scientific literature. Participation in relevant scientific conferences. 4- Scientific laboratories with other universities.
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Student Workload (SWL)

Structured SWL (h/sem)	78	Structured SWL (h/w)	5
Unstructured SWL (h/sem)	97	Unstructured SWL (h/w)	6.5
Total SWL (h/sem)	175		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) ,	
Week	Material Covered
Week 1	The importance of livestock, the importance of fodder crops and their role in meeting the fodder needs of livestock, the reality of growing fodder crops in Iraq.
Week 2	Factors affecting fodder production and quality, exploitation of saline and dry lands in the production of fodder crops.
Week 3	Production of leguminous fodder crops (1) (Jet) Economic importance, suitable environmental conditions, production of Jet seeds.
Week 4	(2) - (Clover) is the same vocabulary as Jat
Week 5	(3) - (hartman, karat, kakouz) the same vocabulary as before
Week 6	Production of cereal fodder crops (1) Yellow corn, including economic importance, suitable environmental conditions, production foundations, and its fodder uses.
Week 7	(2) - (Sorghum, Sudanese cannabis) The same vocabulary as before, with the mention of species belonging to the genus Sorghum (Soryhum). The danger of green feeding to animals as a result of poisoning with hydrocyanic acid (HCN).
Week 8	(3) - (Barley, oats, millet) economic importance, foundations of production, species used for the purpose of fodder, and their exploitation for the purpose of fodder
Week 9	Concentrated feed materials, their importance in animal nutrition, their sources, their nutritional content (chemical composition).
Week 10	Feed mixtures, their definition, importance, types, and the basics of the elements included in the feed mixture.
Week 11	Threshing, its definition, its importance in feeding animals, why do we resort to threshing, determining the appropriate time for cutting according to the stages of growth, drying methods, types of loss of fodder material during the work of threshing.
Week 12	Silage, its definition, the importance of its manufacture, manufacturing steps, determining the stages of cutting, chemical changes to the feed during preservation, methods of preserving silage, preservatives, types of loss in nutritional value resulting from preservation.
Week 13	Pastures, their definition, importance, and types.
Week 14	Foundations of quantitative assessment of pasture germination and determination of pasture productivity.
Week 15	Reasons for the deterioration of natural pastures, methods for improving natural pastures and how to preserve them.

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	General evaluation of coarse and concentrated plant feed materials. Nutritional value of plant feed materials.
Week 2	Studying the phenotypic appearance and diagnosing the seeds of the following crops: barley, oats, Sudanese grass, millet, white and yellow corn, beans, jet, clover, and hartman, preparing the soil, and amending the panels designated for planting.
Week 3	The importance of conducting experiments and research in the field of fodder crop production and natural grazing areas, explaining a plan for growing summer fodder crops in the field designated for them, preparing the soil (continuation).
Week 4	Cultivation of the views field with fodder crops.
Week 5	Botanical description of the crop, its types and groups, use of the forage crop in animal nutrition (mowing, grazing, preservation), completion of the remaining field operations.
Week 6	Botanical description of clover, embroidery, exploitation of clover in animal feed (mowing, grazing, preserving).
Week 7	Botanical description of the following crops: hartaman, cocoa, kachun, peas, fodder, and turmeric, and the exploitation of these crops in animal feed.
Week 8	Botanical description of the following cereal fodder crops, yellow and white corn, exploitation of these crops in animal feed, showing scientific films.
Week 9	Botanical description of Sudanese grass, millet, barley, oats, exploitation of these crops in animal feed, field follow-up.
Week 10	Manufacturing green fodder as fodder, preparing work supplies, manufacturing fodder as fodder in the natural and industrial way.
Week 11	Manufacturing green fodder as silage, steps to prepare silage, preparing work supplies, showing a scientific film.
Week 12	Discussing students' reports on their observations, conducting seminars.
Week 13	Scientific visit.
Week 14	Collecting and preserving models of fodder plants, displaying preserved models.
Week 15	Collecting and preserving models of fodder plants, displaying preserved models.

Learning and Teaching Resources		
	Text	Available in the Library?
	Al-Ani, Tariq Ali and Mr. Irfan Muhammad Rashid (1983). Production of fodder crops and pastures. Technical Institutes Foundation. Al-Tikriti, Ramadan Ahmed Al-Tayef, Tawakkol Younis Rizk, and Hikmat Askar Al-Rumi (1981). Fodder crops and pastures, Dar Al-Kutub Foundation for Printing and Publishing, University of Mosul. Mayouf, Mahmoud Ahmed and Abdullah Qasim Al-Fakhri (1982). Introduction of legumes in Iraq. Abdullah, Ghazi Mahmoud (1976). Some methods used in studies of natural pastures. Ministry of Agriculture and Agrarian Reform, Natural Pastures Directorate, Agricultural Affairs Department, Bulletin No. 97.	
Recommended Texts		No
Websites		

Grading Scheme			
Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group	FX - Fail	(45-49) (0-44)	More work required but credit awarded

(0 - 49)	F - Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information					
Module Title	Field Irrigation Method			Module Delivery	
Module Type	C			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	DES 401				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	4th level		Semester of Delivery		
Administering Department		Department of Desertification Control Technology		College	Technical Agricultural College
Module Leader	Ahmed Faris Salim			e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title		lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Mohammed Salem Ahmed			e-mail	mohameedsa66@ntu.edu.iq
Peer Reviewer Name		Name		e-mail	E-mail
Scientific Committee Approval Date		01/04/2024		Version Number	1.0

Relation with other Modules				
Prerequisite module	Irrigation and puncture.		Semester	
Co-requisites module			Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Teaching students about field irrigation methods and how to implement them in the field, and conducting practices and experiments in this field
Module Learning Outcomes	Important: Write atleast 6 Learning Outcomes, better to be equal to the number of study weeks. Introducing students to the: Meaning of field irrigation Choose the irrigation method Field irrigation methods Surface irrigation Basin irrigation Strip irrigation , irrigation by irrigation Sprinkler irrigation
Indicative Contents	Types of communication in the field of work The ability to express and convey ideas clearly and confidently Teamwork.

Learning and Teaching Strategies	
Strategies	Theoretical exams (daily, monthly, final) Oral exams Participations inside the hall Homework

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	82	Unstructured SWL (h/w)	5.5
Total SWL (h/sem)	175		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	The meaning of field irrigation, choosing an irrigation method, field irrigation methods, surface irrigation, basin irrigation
Week 2	Surface irrigation, strip irrigation, and sprinkler irrigation.
Week 3	Sprinkler irrigation, benefits and uses of sprinkler irrigation, disadvantages and difficulties
Week 4	Sprinkler irrigation system components (pumping unit, pipe network, sprinklers, valves, gauges)
Week 5	Types of sprinkler irrigation systems (fixed and mobile)
Week 6	Water distribution around the sprinkler, water distribution patterns
Week 7	Installation, installation and operation of the sprinkler irrigation system (fixed and mobile) and its maintenance
Week 8	Introduction to drip irrigation, definition of drippers, types of drippers, calculating the number of drippers.
Week 9	Classification of the complete drip irrigation network
Week 10	Installation and operation of drip irrigation, self-operation
Week 11	Operating the control device, operating the piping network, operating the drippers and filters
Week 12	Maintaining drippers, treating mineral and organic deposits, cleaning the drip irrigation system
Week 13	Operating water wells fed by irrigation and drip systems
Week 14	Subsurface irrigation method, how to install, operate and maintain subsurface irrigation.
Week 15	Smart irrigation method: installation, operation and maintenance of this method.

Delivery Plan (Weekly Practical Syllabus)	
	Material Covered
Week 1	Informing, training, and practicing the design and implementation of surface irrigation methods (panels, strips, and passes)
Week 2	Introducing the parts of the sprinkler irrigation network and the different sprinkler systems.
Week 3	Experiment with measuring a sprinkler with one or two nozzles and measuring sprinkler pressure. Experiment with measuring the difference in sprinkler discharge with a difference in operating pressure.
Week 4	A scientific visit to one of the sprinkler irrigation projects
Week 5	An experiment to find the benefits of sprinkler irrigation.
Week 6	Solve problems about the length and number of irrigation pipes and the number of moves.
Week 7	Identifying the parts of the drip irrigation system in the laboratory or field, identifying the types of drippers and calculating costs.
Week 8	Calculating expenses through closed tubes, calculating expenses through a multi-hole tube.
Week 9	A scientific visit to one of the drip irrigation projects.
Week 10	Field selection experiment for drip regularity
Week 11	Connecting the pipe network that makes up the drip irrigation system
Week 12	Introduction to filtration devices and injection devices, connecting them to the network and dismantling them.
Week 13	A visit to one of the smart irrigation projects and knowledge and training on its operation.
Week 14	Discussing student reports.
Week 15	

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Required prescribed books Electronic references, Internet sites...	
Recommended Texts	Recommended books and references (scientific journals, reports,...)	
Websites	Electronic references, Internet sites...	

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



MODULE DESCRIPTION FORM

Module Information				
Module Title	Soil reclamation		Module Delivery	
Module Type	Department requirement		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	DES 402			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	4 th level			
Administering Department		Department of Desertification Control Technology	College	Technical Agricultural College of Mosul
Module Leader	Ahmed Faris Salim		e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title	lecturer		Module Leader's Qualification	Ph.D
Module Tutor			e-mail	
Peer Reviewer Name	Omar Younis Hasan		e-mail	mti.lec224.omar@ntu.edu.iq
Scientific Committee Approval Date	01/04/2024		Version Number	1.0

Relation with other Modules			
Prerequisite module	Soil science, soil chemistry, soil physics.	Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introducing the student to methods of delivering water and utilizing it to irrigate agricultural land and acquiring the necessary skills to implement an irrigation project and irrigation systems therein and how to conduct them. Preparing and preparing the student to pay attention to digging and land reclamation and providing him with information to develop his necessary experience in field investigation work.
Module Learning Outcomes	Important: Write atleast 6 Learning Outcomes, better to be equal to the number of study weeks. 1- The ability to determine the foundations of irrigation and drainage in dry areas. 2- The ability to determine climate elements in dry areas and irrigation methods 3- Study of plants and their relationship to the ecosystem and climate elements in dry areas 4- Identifying plant succession, Iraq's climatic zones, and its environment types. Course-specific skills objectives. 1- The ability to discuss in a scientific spirit and express what is involved in studying the subject. 2- The ability to communicate and inquire with a teacher
Indicative Contents	Types of communication in the field of work The ability to express and convey ideas clearly and confidently Teamwork.

Learning and Teaching Strategies	
Strategies	Theoretical exams (daily, monthly, final)
	Oral exams
	Participations inside the hall
	Homework

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	82	Unstructured SWL (h/w)	5.5
Total SWL (h/sem)	175		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	The science of irrigation, its definition, the benefits of irrigation, an idea about the types of irrigation, the physical characteristics of the soil, field capacity, wilting point, soil moisture and methods of measuring it, saturation.
Week 2	Water seepage and leakage, soil-seepage relationship, irrigation water preparation, water consumption and measurement methods
Week 3	Water standard, calculating irrigation depth, calculating sections for open channels and drainages using equations (Mank, Chezi, Darcy, optimal hydraulic section)
Week 4	Field surveys for irrigation and drainage projects, general planning for irrigation and drainage networks, levels of open canals
Week 5	Leakage from canals, lining of canals, its benefits, types of lining, materials used in lining.
Week 6	Land adjustment and leveling works (calculating the depths of excavation and backfilling)
Week 7	Surface irrigation, strip irrigation, and sprinkler irrigation.
Week 8	Calculator applications about irrigation.
Week 9	Puncture, introduction, excess water, its sources and effect on plants, methods of treating it, controlling sources of excess water.
Week 10	Permeability, permeability coefficient, measured in the laboratory, constant and variable pressure method, field method for measuring permeability (cylindrical hole method, piezometer method)
Week 11	Study theory, Forchheimer, types of trocars, open trocars, covered trocars, surface trocars and their calculations, calculating the spacing of subsurface trocars for homogeneous soils.
Week 12	Land reclamation, introduction to the land washing process, washing requirements, washing efficiency coefficient, water and salt balance for various saline lands, washing processes in saline soils and waterlogged soils.
Week 13	Trocar installations, trocar materials (tubes, pipe covers), special accounts
Week 14	Operating irrigation and drainage projects, stages of operation and maintenance of irrigation and irrigation, and maintenance sections.
Week 15	Drainage networks, operation of the drainage system, water drainage methods, types of maintenance of irrigation and drainage projects, maintenance machines and equipment, removing brush and reeds from streams and graveyards, maintenance of the drainage system, drainage problems in Iraq, land reclamation methods in northern, central and southern Iraq..
Week 16	

Delivery Plan (Weekly Practical Syllabus)

	Material Covered
Week 1	Showing films and slides on irrigation, an experiment to determine the apparent and true density of the soil, solving problems about the physical properties of the soil.
Week 2	Solving problems about field capacity, an experiment to measure moisture content using the laboratory method, an experiment to measure moisture content using field methods.
Week 3	An experiment to estimate the rate of water flow into the soil, solve problems about water consumption, solve problems about water consumption, and calculate the number of plants.
Week 4	Calculating sections for open canals using different rates, drawing longitudinal and transverse sections of irrigation canals, experimenting with measuring water seepage from canals.
Week 5	A scientific visit to one of the irrigation projects.
Week 6	Conduct modification and adjustment work for a specific field
Week 7	Exercises on strip irrigation, exercises on sprinkler irrigation
Week 8	Calculator applications about irrigation
Week 9	Designating an area and conducting a survey of it, drawing a topographical map of the area, showing a scientific film on how to implement trocars.
Week 10	A scientific visit to one of the mining projects in the region.
Week 11	Collecting samples of ground water and measuring its electrical conductivity and exchangeable sodium ratio, a laboratory experiment to wash the soil of salts, water and salt balance issues.
Week 12	Placing a network of trocars in an area and taking the possibilities of changing the network. Drawing a longitudinal section of specific trocars and putting all the details on it along with the design of the trocars.
Week 13	Preparing schedules for periodic maintenance work and filling them out by the students, a scientific visit to the earthquake project, viewing the machines and excavators used in the implementation and maintenance work of the earthquake.
Week 14	Using the Internet to view the latest developments in puncture projects in the world
Week 15	Maintaining types of pumps used in drainage projects, identifying defects in drainage networks and how to fix them, discussing one of the drainage projects implemented in Iraq.

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Required prescribed books Electronic references, Internet sites...	
Recommended Texts	Recommended books and references (scientific journals, reports,....)	
Websites	Electronic references, Internet sites...	

Grading Scheme			
Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
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Fail Group (0 - 49)	FX - Fail	(45-49)	More work required but credit awarded
	F - Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information				
Module Title	Wind erosion prediction models		Module Delivery	
Module Type	Department requirement		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	DES 403			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	4th level	Semester of Delivery		
Administering Department	Department of Desertification Control Technology		College	Technical Agricultural College
Module Leader	Ahmed Faris Salim		e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title	lecturer		Module Leader's Qualification	Ph.D
Module Tutor	Samir F. Ayoud		e-mail	Samir.f.ayoub@ntu.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date		Version Number	1.0	TAC

Relation with other Modules			
Prerequisite module	Wind,soil, Desertification.	Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introducing the student to the concept of wind erosion, its types, mechanics, types of wind, methods, techniques, foundations of resistance, and its environmental and economic risks..
Module Learning Outcomes	Important: Write atleast 6 Learning Outcomes, better to be equal to the number of study weeks. A- Cognitive objectives 1- The ability to identify the elements of wind erosion in dry areas. 2- Identify methods of wind erosion and how to combat it in dry areas 3- Study of plants and their relationship to the ecosystem and climate elements in dry areas 4- Identifying plant succession, Iraq's climatic zones, and its environment types. B- The skills objectives of the course. 1- The ability to discuss in a scientific spirit and express what is involved in studying the subject. 2- The ability to communicate and inquire with the subject teacher Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.
Indicative Contents	Types of communication in the field of work The ability to express and convey ideas clearly and confidently Teamwork.

Learning and Teaching Strategies	
Strategies	Theoretical exams (daily, monthly, final) Oral exams Participations inside the hall Homework

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	82	Unstructured SWL (h/w)	5.5
Total SWL (h/sem)	175		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction: The concept of erosion / types of erosion / wind erosion
Week 2	Factors affecting wind erosion 1- Climate: wind/rain/temperature 2- Land use 3-Topography 4- Soil characteristics
Week 3	Types of wind erosion: Type of wind erosion 1- Winnowing 2- Itching or abrasion 3-Avalanching
Week 4	Wind erosion mechanics 1- Soil loosening and disintegration 2- Initiation of soil movement 3- Transporting 4- Deposition
Week 5	Types of soil movement by wind 1- Suspended load 2- Saltation jumping 3-Creep Surface
Week 6	Hazard of wind erosion / Tolerance limit of wind erosion
Week 7	Wind erosion control -mechanical methods Tillage / No-tillage system / Emergency –tillage / mechanical barriers
Week 8	The most important deciduous fruit trees in Iraq - importance - methods of propagation - varieties - most important service operations
Week 9	Wind erosion control – chemical methods Mulches / natural and industrial coatings / oils and petroleum derivatives
Week 10	Wind erosion control – chemical methods Mulches / natural and industrial coatings / oils and petroleum derivatives
Week 11	The most important winter vegetables in Iraq
Week 12	Sand dunes / Sand dune stabilization methods - chemical and biological methods
Week 13	Economic and social effect of wind erosion
Week 14	Dust storms-the sources and its agricultural effectiveness
Week 15	The main attempts to protect soil from wind erosion / basic principles for controlling wind erosion

Delivery Plan (Weekly Practical Syllabus)	
	Material Covered
Week 1	Slides and movies
Week 2	Applications of the general equation WEE in the field
Week 3	Dry sieving
Week 4	Calculate the dry weighted diameter rate
Week 5	Surface roughness calculations according to tables
Week 6	Climate factor calculations
Week 7	Calculates the length of the unprotected field
Week 8	Calculate plant density
Week 9	Calculate plant density
Week 10	Demolition rate calculations
Week 11	Statistical measures: sorting, skewness and kurtosis coefficient
Week 12	Statistical measures: sorting, skewness and kurtosis coefficient
Week 13	Wind tunnel experiments
Week 14	Wind tunnel experiments
Week 15	Field tours

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Required prescribed books Electronic references, Internet sites...	
Recommended Texts	Recommended books and references (scientific journals, reports,...)	
Websites	Electronic references, Internet sites...	

Grading Scheme			
Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group	FX - Fail	(45-49)	More work required but credit awarded
(0 - 49)	F - Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



MODULE DESCRIPTION FORM

Module Information					
Module Title	Employability skills			Module Delivery	
Module Type	B			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	TAMO 401				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	4th level		Semester of Delivery		
Administering Department	Department of Desertification Control Technology		College	Technical Agricultural College	
Module Leader	Ahmed Faris Salim		e-mail	ahmedalsawaf@ntu.edu.iq	
Module Leader's Acad. Title	lecturer		Module Leader's Qualification	Ph.D.	
Module Tutor	Amina mahir azeez		e-mail	Amina.mahir@ntu.edu.iq	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date			Version Number		

Relation with other Modules			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	1. Developing core skills: Enhancing students' communication, teamwork, and problem-solving skills. 2. Preparing for the job market: Equipping students with the knowledge and skills needed to keep up with the demands of the modern job market. 3. Enhancing critical and creative thinking: Encouraging students to think critically and creatively to develop new and innovative solutions. 4. Adapting to change: Teaching students how to adapt to rapid changes in the work environment and technology. 5. Building self-confidence: Enhancing students' self-confidence and their ability to succeed in different work environments.
Module Learning Outcomes	1. Developing Communication Skills: The ability to communicate effectively verbally and in writing in a variety of work environments. 2. Teamwork: The ability to work effectively as part of a team, including collaboration and conflict resolution. 3. Problem Solving: The ability to analyze problems and develop innovative and effective solutions. 4. Critical Thinking: The ability to think critically and evaluate information to make informed decisions. 5. Time Management: The ability to organize time and manage tasks effectively to achieve goals. 6. Adapt to Change: The ability to adapt to changes in the work environment and technology.
Indicative Contents	1. Introduction to Labor Market Skills: Definition and importance of skills in the modern labor market. 2. Communication Skills: Developing oral and written communication skills. 3. Teamwork Skills: Collaboration and conflict resolution within the team. 4. Critical Thinking and Problem Solving: Critical thinking techniques and problem solving strategies. 5. Time Management and Organization: Time management methods, task organization and priorities.

Learning and Teaching Strategies

Strategies	Periodic reports / periodic tests / practical case studies.
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Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.3
Total SWL (h/sem)	50		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	General concepts about professionalism, the importance of work for humans in the Holy Quran and the Prophetic Hadith, the concept of the labor market, types of labor market (public sector and private sector) and the nature and environment of each sector.
Week 2	The most important sectors of the labor market in Iraq (public and private), and the laws governing them (Civil Service Law, State Employees Discipline Law, and Labor and Social Security Law), with practical application.
Week 3	Soft skills required in the labor market.
Week 4	CV writing skills, what to mention and what to avoid when writing a CV, with practical applications.
Week 5	Skills for passing the personal interview, how to prepare for it before the interview, mechanisms for dealing with personal interviews, the most important questions asked during the interview and how to answer them, with practical application.
Week 6	Time management with its applications at work.
Week 7	Leadership skills, communication and emotional intelligence, with practical application.
Week 8	Skills for working within a team and how to solve problems, with practical application.
Week 9	Marketing and e-marketing methods, with practical application.
Week 10	Small projects, how to establish them and prepare feasibility studies for them, with practical application.
Week 11	Skills for communicating with the labor market and using modern technologies Facebook, LinkedIn with practical applications
Week 12	Decision-making skills, with practical applications.
Week 13	How to develop your skills as a student during your university studies.
Week 14	Success stories of well-known and prominent individuals and companies.
Week 15	View jobs and mechanisms for preparing for them by the student, with practical application

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Human Resources Management: The Distinguished Administrative Series Author: Lebanon Publishers Library Publisher: Lebanon Publishers Library	Yes
Recommended Texts	Human Resources Management: A Brief Guide Author: Abdulaziz Omar Barqaba Al-Amoudi	
Websites	تقرير موجز عن مشروع تقييم سوق العمل وتحليل المهارات، العراق وإقليم كوردستان العراق للأمم المتحدة - UNESCO	

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Fluid modeling			Module Delivery	
Module Type	Department requirement			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	DES 404				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	4th Level		Semester of Delivery		
Administering Department		Department of Desertification Control Technology		College	Technical Agricultural College
Module Leader	Ahmed Faris Salim			e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title		lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Omar ahmed fathi			e-mail	omar.ah.f@ntu.edu.iq
Peer Reviewer Name				e-mail	
Scientific Committee Approval Date				Version Number	1.0

Relation with other Modules			
Prerequisite module		Semester	
Co-requisites module		Semester	

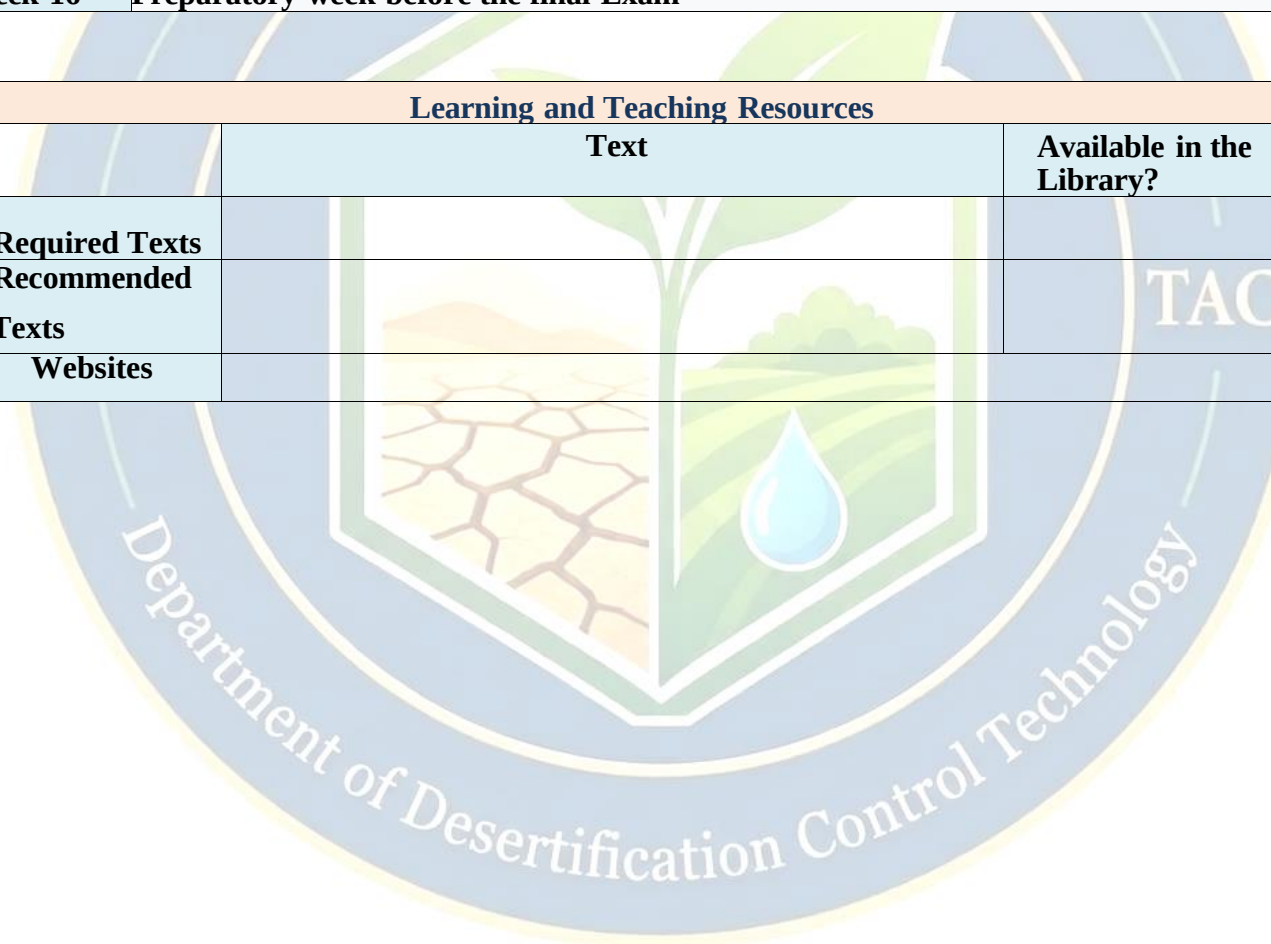
Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introduction to modeling, Hydrus program, main menu, program windows, output files, applied examples of one or more layers of soil, movement of salts, drainage, and soil temperature.
Module Learning Outcomes	
Indicative Contents	1- That what the student studies should be consistent with his inclinations and thinking trends 2- That the student feels the importance of correcting refractive errors in the eye 3-The student should listen carefully to the professor's explanation 4- That the student feels what cognitive excellence and excellence mean 5- That the student recognizes the impact of science and scientists 6-The student must pay attention to respecting the time and class system

Learning and Teaching Strategies	
Strategies	

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	107	Unstructured SWL (h/w)	7.1
Total SWL (h/sem)	200		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to modeling
Week 2	Hydrus main menu
Week 3	Data entry windows
Week 4	Variables of ocean conditions
Week 5	Geometrics information windows
Week 6	Output files
Week 7	Practical examples of the single-layer percolation model
Week 8	Practical examples of the multi-layer infiltration model
Week 9	Practical examples of evaporation from soil
Week 10	Examples of puncture
Week 11	Practical examples of the movement of charged salts
Week 12	Practical examples of permeability
Week 13	Soil heat movement
Week 14	Movement of gases in the soil
Week 15	Inverse modeling and applied examples
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts		TAC
Recommended Texts		
Texts		
Websites		

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



MODULE DESCRIPTION FORM

Module Information معلومات المادة الدراسية			
Module Title	Dry lands plants		Module Delivery
Module Type	Department requirement	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	DES 405		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	4 th Level		
Administering Department	Department of Desertification Control Technology	College	Technical Agricultural College
Module Leader	Ahmed Faris Salim	e-mail	ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D
Module Tutor	Samir F. Ayoud	e-mail	Samir.f.ayoub@ntu.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Teaching and introducing students to the plants of dry areas - dry and semi-arid lands and their importance, dry farming systems, environmental factors prevailing in dry lands and their effects on plants. Types of plants used in dry farming.
Module Learning Outcomes	Important: Write atleast 6 Learning Outcomes, better to be equal to the number of study weeks.
Indicative Contents	1- That what the student studies should be consistent with his inclinations and thinking trends 2- That the student feels the importance of correcting refractive errors in the eye 3- The student should listen carefully to the professor's explanation 4- That the student feels what cognitive excellence and excellence mean 5- That the student recognizes the impact of science and scientists 6- The student must pay attention to respecting the time and class system

Learning and Teaching Strategies	
Strategies	1- Types of communication in the field of work 2- The ability to express and convey ideas clearly and confidently 3- Teamwork.

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	132	Unstructured SWL (h/w)	8.8
Total SWL (h/sem)	225		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Definition of plants of dry areas - dry and semi-arid lands and their importance.
Week 2	Dry farming systems - their importance for providing food - percentage of dry lands.
Week 3	Environmental factors prevailing in drylands and their effects on plants.
Week 4	Water sources in dry areas - water conservation and storage - water consumption.
Week 5	Amending organic matter in the soil.
Week 6	Modern irrigation systems prevailing in dry lands - and the economy with irrigation water.
Week 7	Water harvesting in dry areas
Week 8	Transformations in dry areas.
Week 9	Vegetation cover in desert lands
Week 10	Shrubs of desert areas
Week 11	Trees of desert areas
Week 12	Medicinal plants in desert areas
Week 13	Cultivation of green belts in desert areas
Week 14	Cultivation of economic crops in dry areas (grains - vegetables - fruits - fodder)
Week 15	Using modern technologies such as sanoplants, hydrocolloid balls, perforated pipes under the soil, and materials that reduce transpiration to reduce water consumption.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Practical Syllabus)

	Material Covered
Week 1	Identify plants of dry areas
Week 2	Phenotypic changes in plants in dry areas - stems, leaves, thorns, and hairs.
Week 3	Anatomical changes - stomata - cuticle.
Week 4	Anatomical changes - tissues - cells.
Week 5	Herbaceous plants in dry desert areas
Week 6	Shrubs of dry desert areas
Week 7	Trees dry desert areas
Week 8	Showing films about desert agriculture.
Week 9	Medicinal plants in dry desert environment
Week 10	Using drip irrigation techniques
Week 11	Using subirrigation techniques
Week 12	Using sanoplast techniques to conserve water
Week 13	Use of antitranspirants techniques
Week 14	A tour in dry areas to learn about vegetation
Week 15	Showing films about modern irrigation systems.

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Dry agriculture / Abdullah Al-Fakhry	
Recommended Texts		
Websites		

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Conservation Agriculture			Module Delivery	
Module Type	Department requirement			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	DES 406				
ECTS Credits	9				
SWL (hr/sem)	225				
Module Level	4th level		Semester of Delivery		
Administering Department		Department of Desertification Control Technology	College	Technical Agricultural College	
Module Leader	Mohammed salim ahmed		e-mail	mohameedsa66@ntu.edu.iq	
Module Leader's Acad. Title		lecturer	Module Leader's Qualification		PHD
Module Tutor	Mohammed salim ahmed		e-mail	mohameedsa66@ntu.edu.iq	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/4/2024	Version Number	1.0	TAC

Relation with other Modules			
Prerequisite module	Plant science, soil, climate.	Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	Teaching and introducing students to air-conditioned agriculture, its goals, purposes, and distribution in the world, the foundations of its establishment, the systems followed in it, and examples of producing some crops using it..
Module Learning Outcomes	Important: Write atleast 6 Learning Outcomes, better to be equal to the number of study weeks. Ability to identify adapted farming methods. Learn about adapted agriculture and how to implement it in dry areas. Study of plants and their relationship to the ecosystem and climate elements in dry areas Identifying plant succession, Iraq's climatic zones, and its environmental types. The ability to discuss in a scientific spirit and express what constitutes a study of the subject. The ability to communicate and inquire with the subject teacher Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.
Indicative Contents	Types of communication in the field of work The ability to express and convey ideas clearly and confidently Teamwork.

Learning and Teaching Strategies

Strategies	Theoretical exams (daily, monthly, final) Oral exams Participations inside the hall Homework
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Student Work Load (SWL)

Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	132	Unstructured SWL (h/w)	8.8
Total SWL (h/sem)	225		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuou s	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Historical overview - definition of adapted agriculture - goals and purposes.
Week 2	Principles for establishing air-conditioned agricultural facilities - location - orientation - area - shape.
Week 3	Climatic factors affecting plant growth in air-conditioned agriculture: temperature - light - humidity - CO ₂
Week 4	Ground factors affecting plant growth in air-conditioned agriculture - types of agricultural media.
Week 5	Construction of plastic tunnels and plastic houses: their shapes - types - plastic specifications.
Week 6	Constructing greenhouses: their shapes - types - type of glass.
Week 7	Methods of heating, cooling and ventilating air-conditioned homes.
Week 8	Production of vegetable seedlings in tunnels and air-conditioned houses.
Week 9	Cultivation systems inside air-conditioned houses: cultivation in ponds - rings - with straw machines - bags - rock wool - hydroponics.
Week 10	Production of some vegetable crops: tomato production.
Week 11	Production of some vegetable crops: production of pepper and eggplant.
Week 12	Production of some vegetable crops: production of cucumbers and squash
Week 13	Production of some vegetable crops: mushroom production
Week 14	Production of some fruit crops: production of strawberries and bananas.
Week 15	Production of some ornamental plants (sperm flowers and shade plants).
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Dry agriculture / Abdullah Al-Fakhry	
Recommended Texts		
Websites		

Grading Scheme			
Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	(45-49)	More work required but credit awarded
	F - Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	Graduation project		Module Delivery
Module Type	C		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar
Module Code	DES 407		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	4th level	Semester of Delivery	
Administering Department	Department of Desertification Control Technology	College	Technical Agricultural College
Module Leader	Ahmed Faris Salim		e-mail ahmedalsawaf@ntu.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	TAC

Relation with other Modules			
Prerequisite module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	
Module Learning Outcomes	
Indicative Contents	

Learning and Teaching Strategies

Strategies	
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Student Workload (SWL)

Structured SWL (h/sem)	33	Structured SWL (h/w)	3.3
Unstructured SWL (h/sem)	20	Unstructured SWL (h/w)	1.33
Total SWL (h/sem)	50		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

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



