



Description of the Rainfed agriculture

1. Course Name:	
Rainfed agriculture	
2. Course Code:	
RAAG412	
3. Semester / Year:	
First semester (autumn)/2023-2024	
4. Description Preparation Date:	
1/2/2024	
5. Available Attendance Forms:	
Attendance lesson	
6. Number of Credit Hours (Total) / Number of Units (Total): units	
2 theoretical + 3 practical / 3.5 units	
7. Course administrator's name (mention all, if more than one name):	
Name:Dr. Ragheed Hamza Mohammed	
Dr. Angham Talal Mahmoud Al-Chalabi	
8. Course Objectives	
Objectives of the course: Educating students about the importance of efficient use of water, how to manage it, reducing water consumption of agricultural crops within sustainable agriculture in light of the lack of water availability, and optimum exploitation in capturing rainwater and groundwater in organic agriculture, raising poultry, livestock, and housing nomadic Bedouins.	

9. Teaching and Learning Strategies

Improving the standard of living of farmers within the importance of water rationing for growing crops and livestock by introducing the concept of water shortages and the decline of lakes and rivers and applying modern methods of agricultural mechanization and optimal exploitation of rainwater and groundwater in permaculture through the introduction of hybrid varieties in sustainable agriculture with high productivity in Circumstances of lack of availability of irrigation water

10. Course Structure

Week	Hours	Required Learning Outcomes	Name of Unit or subject	Learning method	Evaluation method
First	2Theoretical	A1: The student learns about the concept of sustainable agriculture and dry farming	An overview of the concept of permaculture	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Interactive lecture, brainstorming, dialogue and discussion, self-learning
	3Practical	C3: Uses the information the farmer needs and the appropriate conditions available to him for agriculture in dry areas	Identify the practical concepts of agricultural operations related to permaculture	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short practical test 1
Second	2Theoretical	A2: Determines the effects of temperature on soil properties	C3: The information the farmer needs is used to divide the areas of agricultural agriculture in Iraq	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Scientific tour of horticultural facilities
	3Practical	C3: The information the farmer needs is used to divide the areas of agricultural agriculture in Iraq	How to identify divisions for dry areas	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Scientific tour of horticultural facilities
Third	2Theoretical	A2: Determines methods for dividing plants based on resistance to drought	Division of aquatic plants - intermediate plants - drought plants - annual plants - seasonal - semi-seasonal Succulents - true xerophytes	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3Practical	A1: List the most important structural functions of vegetable crops that grow under conditions of lack of water D1: Acquire the communication skills necessary to deal with confidence and certainty on all topics related to permaculture	How to train to carry out some important agricultural operations to increase and improve production in farming	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short test
Fourth	2Theoretical	A2: Definition of the effect of water stress on plants and the effect on physiological processes	The general foundations and principles used in carrying out agricultural operations	Identify the benefits of acclimatization and its effect on plants and their resistance to harsh environmental conditions	Semester test 1, final test report
	3Practical	C3: Uses the information the farmer needs and what is available to him to master work C4: Divides dry areas into several sections	Identify the benefits of acclimatization and its effect on plants and their resistance to harsh environmental conditions	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	Short practical test 2
Fifth	2Theoretical	C4: Draw the non-rainfall factors determining the success of permaculture	Climatic conditions and their impact on the speed and intensity of rain - the ability of the soil to absorb water - the percentage of air humidity - timing of rain fall - the amount of evaporation during the growing	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester test 1, final test report

			season		
	3Practical	C3: Uses the information to determine what the farmer needs and what is available to him to master his work C4: The student learns the meaning of marking and what it depends on	The important points on which the evaporation process depends	Interactive lecture, brainstorming, dialogue and discussion, self-learning	writing a report
Sixth	2Theoretical	A2: Determines what are the disadvantages of no-till agriculture	Lack of humus formation - spread agricultural pests - increased weed growth - accumulation of salts - delayed seed growth	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
	3Practical	C2: Innovates methods for breeding and improving different types of varieties designed for the harsh environmental conditions of agriculture in dry areas C3: Uses a soil maintenance method	Determine the causes of soil deterioration in dry areas	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Write a report and homework
Seventh	2Theoretical	A3: It employs crops that can be grown under dry farming conditions	Determine the crops that are grown such as wheat, barley, local corn, watermelon, cucumber, cucumbers, lentils, and chickpeas.	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 2, final exam
	3Practical	C3: Uses the information the farmer needs to overcome drought	Distinguishing between semi-arid areas and dry areas	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test
Eighth	2Theoretical	C4: Defines what supplemental irrigation under stress conditions	Learn about modern methods in agriculture	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 2, final exam
	3Practical	C5: Successfully evaluate the factors affecting production in dry farming	Determine the effect of plant type and land topography	Interactive lecture, brainstorming, dialogue and discussion, self-learning	writing a report
Ninth	2Theoretical	E4 defines what irrigated agriculture is C3: The farmer uses the information he needs and what is available to him to grow crops in dry lands	The concept of irrigated agriculture	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 2, final
	3Practical	C4: Draws the reasons for the importance of soil in semi-arid areas compared to dry areas	Determine the difference between arid and semi-arid areas	Interactive lecture, brainstorming, dialogue and discussion, self-learning	short exam
Tenth	2Theoretical	A2: Determines the importance of the role of water in plant growth	Providing the soil with moisture to avoid drought and creating appropriate climatic conditions	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester test2
	3Practical	C3: Uses the information the farmer needs and what is available for cultivation under permaculture conditions C4: The cessation of annual rainfall is determined by several factors	Factors on which dry farming depends	Interactive lecture, brainstorming, dialogue and discussion, self-learning	short exam
Eleventh	2Theoretical	A2: Determines the methods of surface irrigation, its	Divisions of irrigation methods, surface irrigation	Interactive lecture, brainstorming, dialogue	Semester test2

		advantages and disadvantages of surface irrigation		and discussion, self-learning	
	3Practical	C3: Uses the information the farmer needs and what is available to him for cultivation under dry farming conditions C4: Draw and determine the effectiveness of rain in relation to the soil	Rainfall effectiveness and crop productivity	Interactive lecture, brainstorming, dialogue and discussion, self-learning	short exam
Twelfth	2Theoretical	A2: Determines the types of subsoil irrigation	Divisions of irrigation types	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final test
	3Practical	C3: Uses the information the farmer needs and what is available to him for agriculture under dry areas conditions C5: Successfully balances rainfall distribution and intensity	Conditions affected by intensity and distribution of rainfall	Interactive lecture, brainstorming, dialogue and discussion, self-learning	writing a report
Thirteenth	2Theoretical	A2: Determines the advantages of sprinkler irrigation	How to perform sprinkler irrigation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final test
	3Practical	C3: Uses the information the farmer needs and the conditions available to him for farming under dry farming conditions C5: Explain the advantages of drip irrigation	Advantages and disadvantages of drip irrigation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Wooden canopy
Fourteenth	2Theoretical	C3: Uses the information the farmer needs and the conditions available to him for farming on farm lands C5: Successfully balances how clouds thicken and drop rain in agricultural fields	Factors that help this process bring down rain artificially	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
	3Practical	C3: Uses the information the farmer needs and the conditions available to him for farming on farm lands C5: Successfully balances how clouds thicken and drop rain in agricultural fields	Factors that help this process bring down rain artificially	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test
Fifteenth	2Theoretical	C4: Identify direct and indirect causes of soil degradation	It determines the causes of the spread of diseases. It is not suitable in vegetable production fields. It may lead to the formation of hard crust and reduce the permeability rate.	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
	3Practical	C3: Uses the information the farmer needs and the conditions available to him for farming on farm lands C5: Successfully balances how clouds thicken and drop rain in agricultural fields	Divide areas that cause	Interactive lecture, brainstorming, dialogue and discussion, self-learning	A tour of the canals

		farmer needs and the conditions available to him farming in dry areas C4: Draw how to conserve moisture and maintain soil C5: Successfully balances maintenance D1: Acquiring skills for methods used to preserve moisture	moisture loss	brainstorming, dialogue and discussion, self-learning	and the greenhouse inside the univer
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11. Course Evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, and reports.

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	A book on plant physiology and external sources
Main references (sources)	Scientific references specialized in permaculture and books concerned with dry agriculture
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://exa.unne.edu.arRainfed agriculture



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