

Course Description Form

1. Name of the course:	Protection Machines and Equipment
2. Course code:	PRME219
3. Semester/year:	First semester (fall)/2023-2024
4. Description Preparation Date:	1/9/2023
5. Available Attendance Forms:	Combined (Attendance + distance education)
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours (30 theoretical hours + 45 practical hours) / 3.5 units
7. Course administrator's name (mention all, if more than one name)	
Name :Mahmoud Hasan Rafik	E.mail: Mahmoud.h.r@uomosul.edu.iq
Name : Layth Mahmood Yahya	E.mail: laithmy@uomosul.edu.iq

8. Course Objectives

Objectives of the study subject

- Identify the types and parts of agricultural equipment in general and agricultural pest control machines and equipment in particular.
- Clarifying the basics and principles of engineering sciences and their applications in agricultural fields related to pest control.
- Discussing every type of agricultural equipment and machinery for combating agricultural crop pests (in terms of structure and function), starting with the control before and during plowing the soil and preparing the seedbed, passing through the stages of serving the growing crop and ending with the harvesting operations and the subsequent processes through which these products are prepared. Agricultural crops, whether for consumption or storage. Conducting the necessary adjustments for agricultural control machines and equipment in order to obtain optimal use in order to achieve the purpose of using these machines.
- The ability to maintain, maintain and repair agricultural control equipment.
- The ability to dismantle, install and repair these machines.
- The ability to manage agricultural control equipment in the field
- The ability to connect machines to the agricultural puller and carry out organizing and calibrating operations for them in a way that suits the agricultural control required to be performed with the agricultural machine.

9. Teaching and Learning Strategies

The strategy

- Interactive lecture
- Brainstorming
- Dialogue and discussion
- Field Training

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	2a, 1a The student learns about the methods of transmitting motion in agricultural machines and machinery, the means used in transmitting motion, and	-The most important means and methods used in transferring and transforming movement and energy in agricultural	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam



		all types of transmission devices. The student acquires knowledge and concepts related to the methods and means used in transporting and transforming movement in agricultural tugs, their components, and the conditions that must be met when designing an agricultural tug.	machines and machinery. -Agricultural tug and its components. - Conditions that must be met when designing an agricultural tug.		
	3 Practical	2c: The student sees the operation of these devices	The mechanism of operation of transmission devices in and the methods used in transferring and converting movement in agricultural pullers	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
2	2 Theoretical	Introducing the student to the agricultural tractor, its types and specifications The student acquires knowledge and concepts related to the agricultural tractor, its types and specifications	Agricultural tug, its types and specifications And the principles adopted in dividing tug engines	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	2c: The student classifies the pullers according to the purpose of use	Introducing the student to the types of agricultural tractors For each type, why it is used, and for which process it can be used	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
3	2 Theoretical	a2: The student explains the main devices of the engine (the foundations of the design and operation of compression and spark engines, the foundations of the design and operation of four-stroke and two-stroke engines). The student acquires knowledge and concepts related to internal combustion engines	Engine devices and components of internal combustion engines, their types and how they work	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam

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	3 Practical	b4: The student explains the main and component parts of the engine The student should be able to disassemble and install the main engine parts	The main and composition parts of the engine and benefit of each part	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
4	2 Theoretical	a2: The student shows the auxiliary parts of the engine, including the fuel, ignition, cooling, lubrication, timing, pilot wheel, crankshaft, and power stages in different sequences. The student acquires knowledge and concepts related to the timing device, pilot wheel, crankshaft, and power stages in different sequences	The auxiliary parts of the engine include the fuel, ignition, cooling, lubrication, timing, pilot wheel, crankshaft, and power stages in various sequences.	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	3c: The student describes the operation of the engine's auxiliary devices, including the fuel, ignition, cooling, lubrication, timing, pilot wheel, and crankshaft devices.	Engine auxiliary devices	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
5	2 Theoretical	a2, a1: Shows and identifies the student with the sequence of power strokes for 4-cylinder and 6-cylinder engines, as well as the phases of gas distribution in the engine.	The sequence of strokes in a 4- and 6-cylinder engine	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	b4: The student explains the sequence of engine strokes for four- and six-stroke engines and the difference between them	The sequence of different strokes inside the engine	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
6	2 Theoretical	a2: The student shows the transmission devices in the agricultural tug (separator device and gearbox). The student acquires knowledge and concepts related to the transmission	Transmission devices in the agricultural tug (separator device and gear box)	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam



		devices in the agricultural tug (separator device and gearbox)			
	3 Practical	b3: Repair and maintenance of transmission devices in agricultural pullers (separator device and gear box in agricultural pullers) The student should be able to monitor safety conditions when working on agricultural equipment and machinery	Maintenance and repair of transmission devices (separator - gearbox)	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
7	2 Theoretical	c3: The student shows the power transmission devices in the agricultural tractor The student acquires knowledge and concepts related to power transmission devices in agricultural tugs	Power transmission devices in agricultural pullers	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	b3: Operating and maintaining power transmission devices in agricultural tugs The student should be able to choose the appropriate plowing method according to the conditions and nature of the field to be plowed	Power transmission parts (operation and maintenance)	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
8	2 Theoretical	2a: Knows mechanical control equipment (plows) The student acquires knowledge and concepts related to spraying equipment for mechanical control	Mechanical control equipment (ploughs)	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	3b: Daily, weekly and end-of-season maintenance of soil preparation equipment (plows) The student should be able to determine the appropriate time to conduct mechanical control operations	Maintaining and maintaining soil preparation equipment (plows)	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1



9	2 Theoretical	3c shows the main parts of the hoeing equipment between the lines of planted plants The student acquires knowledge and concepts related to mechanical control equipment	Hoeing equipment between lines of planted plants	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	3b: Daily, weekly and end-of-season maintenance of hoeing equipment between the lines of planted plants The student should be able to determine the appropriate method for performing the required maintenance operations	Maintaining and maintaining hoeing equipment between the lines of planted plants	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
10	2 Theoretical	4c, 2a: The student shows and explains the chemical control equipment (sprays), the factors affecting control, and the time and method of control. The student acquires knowledge and concepts related to spraying equipment for chemical control	Chemical control equipment (sprays).	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	1b: Calculating the amount of pesticide needed per unit area and maintaining and maintaining the control equipment The student should be able to organize sprinklers and how to practice chemical control	Calibration and maintenance of control equipment	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
11	2 Theoretical	4c, 2a: The student shows and explains the types of sprinklers (hydraulic, pneumatic, fan) The student acquires knowledge and concepts related to spraying equipment for chemical control	Types of sprinklers (hydraulic, pneumatic, fan)	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam



	3 Practical	3b: Daily, weekly and end-of-season maintenance of sprinklers (hydraulic-pneumatic helicopter) The student should be able to determine the appropriate time to perform maintenance operations for this type of sprinkler	Maintenance and maintenance of sprinklers (hydraulic, pneumatic, helicopter)	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
12	2 Theoretical	c3: Scientific visit The student acquires knowledge and concepts related to mechanical and chemical control equipment The student should be able to monitor safety conditions when working on agricultural equipment and machinery related to mechanical and chemical control equipment	Scientific visit	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	1b Scientific visit: The student will be able to monitor safety conditions when working on agricultural equipment and machinery related to pest control equipment.	Scientific visit	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
13	2 Theoretical	4c, 2a: The student shows and explains how to use aircraft in the pest control process and the factors influencing the method of pest control using aircraft. The student acquires knowledge and concepts related to spraying equipment using aircraft for chemical control	The use of aircraft in the control process	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	1b: Calculating the amount of pesticide needed per unit area using aircraft and maintaining and maintaining the control equipment attached to the aircraft. The student should be able to calibrate and maintain sprinklers attached to aircraft	Calibrating and maintaining control equipment	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1

14	2 Theoretical	2a: Knows chemical control equipment (disinfectants) The student acquires knowledge and concepts related to spraying equipment for chemical control	Chemical control equipment (disinfectants).	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	: 3b Daily, weekly and end-of-season maintenance of chemical control equipment (disinfectants) The student should be able to determine the appropriate time and quantity to conduct the pest control operation	Maintaining and maintaining control equipment (disinfectants)	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1
15	2 Theoretical	4c, 2a: The student shows and explains the method of using pesticides, preventive measures, and safety in using pesticides in the control process. The student acquires knowledge and concepts related to preventive measures and safety in the use of pesticides during pest control	Preventive and safety measures in the use of pesticides during pest control	Interactive lecture, brainstorming, dialogue and discussion, field training	Semester exam 1, final exam
	3 Practical	2a The student shows the method of using pesticides, preventive measures, and safety in using pesticides in the control process The student acquires knowledge and concepts related to preventive measures and safety in the use of pesticides during pest control	Preventive and safety measures in the use of pesticides during pest control	Interactive lecture, brainstorming, dialogue and discussion, field training	Short practical test1

11. Course Evaluation

Seq.	Evaluating style	Calendar date (week)	marks	Relative weigh%
1	Report 1	fourth week	2.5	2.5
2	Report 2	fifth week	2.5	2.5
3	Short test (1) Quiz	sixth week	2	2
4	Short test (2) Quiz	fourteenth week	2	2
5	Short test (3) Quiz	fifteenth week	1	1



6	Semester test (1)	sixth week	7.5	7.5
7	Semester test (2)	eleventh week	7.5	7.5
8	Final theoretical test	Final semester exams	40	40
9	Practical field project	fifteenth week	5	5
10	Field evaluation	third and fifth week	2	2
11	Short practical test (1) Quiz	first week	1	1
12	Short practical test (2) Quiz	fourth week	0.5	0.5
13	Short practical test (3) Quiz	fourteenth week	1	1
14	Live drawings and homework	Weeks 6,8,9,10,11,12,13	5.5	5.5
15	Final practical test	Final semester exams	20	20
	total	100	100%	100%

12. Learning and teaching resources

Required textbooks (methodology, if any)

- 1 - Soil preparation equipment, written by Dr. Aziz Ramo Al-Banna.
- 2 Agricultural machines and machinery, written by Dr. Yassin Hashem Al-Tahan and Dr.. Muhammad Jassim Al-Naama.
- 3 Field crop mechanization equipment, written by Mr. Lotfi Hussein friendship. Abdul Salam Mahmoud.
- 4 - Agricultural mechanization
Written by: Dr. Muhammad Sayyid Imran Engineer: Kamal Muhammad Nafi
- 5 - Agricultural mechanization
Written by: Dr. Mubarak Muhammad Mustafa Dr. Essam Ahmed Sahar
- 6- Agricultural engineering and mechanization
Written by: Dr. Youssef Farag
Engineer Kamal Muhammad Nafi

Main references (sources)

Agricultural mechanization (pullers and agricultural machines), written by Ahmed Al-Rai Imam Suleiman and Sami Muhammad Younis

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

Electronic references, Internet sites



Theoretical subject teacher: Mahmoud Hassan Rafiq



Practical subject teacher: Laith Mahmoud Yahya



Chairman of the Scientific Committee




Head of the Plant Protection Department