Course Description Form for Agricultural Machines and Equipment

1. Course Name:
Agricultural machines and equipment
2. Course Code:
AGME207
3. Semester / Year:
The second spring semester/first stage/2023-2024
4. Description Preparation Date:
1/2/2024
5. Available Attendance Forms:
in-person
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours (2 theoretical + 3 practical / 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Prof. Montaser Khairie Hussain and Lecturer Layth Mahmod Yahya Email: montaser.hussain@uomosul.edu.iq
8. Course Objectives
• Identify the components and parts of agricultural tractors, starting with the engine and its main and auxiliary devices. • Clarifying the basics and principles of engineering sciences and their applications in various agricultural fields. • Discussing every type of agricultural equipment and machinery for the production of agricultural crops (in terms of structure and function), starting from plowing the soil and preparing the seedbed, passing through the stages of serving the growing crop, and ending with harvesting operations and the subsequent processes through which these agricultural products are prepared, whether for consumption or Storage. • Make the necessary adjustments to agricultural machines in order to obtain the optimal use of those machines and reach the intended use of those machines. • The ability to maintain and repair agricultural equipment. • The ability to disassemble and install these machines. • The ability to manage agricultural equipment in the field. • The ability to connect machines to the agricultural puller and organize and calibrate operations for them in a way that suits the agricultural process required to be performed with the agricultural machine.
9. Teaching and Learning Strategies
- Interactive lecture, - Brainstorming - Dialogue and discussion - Field Observation - Practical exercises - Field project - Self-Study
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	a2: Introducing the student to the methods of transmitting motion in agricultural machines and machinery and the means used to transmit motion	Methods and means used in transporting and shifting the movement of agricultural pullers	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3	b1: Calculating the movement transfer rate in and the methods used in transferring and converting movement in agricultural pullers The student should be able to identify the methods used in transporting and shifting the movement of agricultural tractors	Mathematical relations for calculating the movement transfer ratio and the methods used in transferring and converting movement in agricultural tractors	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
2	2	a2: Introducing the student to the agricultural tractor, its types and specifications	Agricultural tractor types and specifications	Interactive lecture, brainstorming, dialogue and	Semester exam 1, final exam

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		The student acquires knowledge and concepts related to the agricultural tractor, its types and specifications		discussion, self-learning	
	3	b2: Training the student to drive an agricultural tractor The student must be able to operate and drive the agricultural tug in a scientific and correct manner	Driving an agricultural tractor	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
3	2	a2: The student explains the foundations of design and operation of compression and spark engines, the foundations of design and operation of four- and two-stroke engines. The student acquires knowledge and concepts related to internal combustion engines	Internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3	b4: The student shows the component parts of the engine The student should be able to disassemble and install engine parts	The main and auxiliary parts of the engine	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
4	2	a2: The student shows the timing device, the pilot wheel, the crankshaft, and the 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	Timing device, pilot wheel, crankshaft and power stages in different sequences	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3	b1: Calculates the working cylinder volume of the engine The student should be able to evaluate the functions of working parts in agricultural equipment and machinery	Technical terminology of the engine and the mathematical relationship of the engine	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
5	2	a2: The student shows the fuel injection device for compression engines The student acquires knowledge and concepts related to the fuel injection device for compression engines	Fuel injection device for compression engines	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3	b3: Repair and maintenance of the fuel injection system in agricultural tractors The student should be able to identify faults in the agricultural tractor engine	Fuel injection system in agricultural tractors and its maintenance	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
6	2	a2: The student learns about the lubrication device and the cooling device in agricultural tractors The student acquires knowledge and concepts related to the lubrication device and the cooling device	Lubrication devices and cooling devices in agricultural pullers	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3	b3: Repair and maintenance of the water-cooling system and the lubrication system in agricultural pullers The student should be able to identify faults in the agricultural tractor engine	The cooling and lubrication system in the agricultural tug and its maintenance	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
7	2	a2: The student shows the transmission devices in the agricultural tug (clutch and gearbox). The student acquires knowledge and concepts related to the transmission devices in the agricultural tug (clutch and gearbox)	Transmission devices in the agricultural tug (clutch and gearbox).	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	3	b3: Repair and maintenance of transmission devices in agricultural pullers (clutch 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 (clutch - gearbox)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
8	2	a2: The student shows the transmission devices in the agricultural tractor (the differential device and the vertical device) The student acquires knowledge and concepts related to the transmission devices in the agricultural tractor (the differential device and the vertical device)	Transmission devices in the agricultural tug (differential device and vertical device)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	b3: Repair and maintenance of transmission devices in agricultural pullers (differential device and vertical device) in agricultural pullers The student should be able to choose the appropriate plowing method according to the conditions and nature of the field to be plowed	Maintenance and repair of transmission devices (differential and vertical devices)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
9	2	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 tractors	Power transmission devices in agricultural pullers	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	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, practical exercises, and self-learning	short exams, assignment of duty, discussions
10	2	c3: The student shows the primary and secondary soil preparation and preparation equipment The student acquires knowledge and concepts related to primary soil preparation and preparation equipment	Primary and secondary soil preparation and preparation equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	b1: Identifying plowing methods and types, applying mathematical relationships to calculate theoretical productivity, actual productivity, and field efficiency of plows. The student should be able to calculate the theoretical and actual productivity and field efficiency of tillage equipment	Methods of plowing with plows, their types, and mathematical and computational applications for plowing equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
11	2	c3: Scientific visit The student acquires knowledge and concepts related to secondary and special soil preparation and preparation equipment The student should be able to monitor safety conditions when working on agricultural equipment and machinery	Scientific visit	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	a2: Identifying the methods of netting and connecting agricultural machinery to the agricultural puller	Methods of netting and connecting agricultural	Interactive lecture, brainstorming, dialogue and discussion, field	short exams, assignment of duty,

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		The student should be able to organize and connect agricultural machinery to the agricultural puller	machinery to the agricultural puller	training, practical exercises, and self-learning	discussions
12	2	a2: The student shows the seeding and agricultural equipment The student should be able to know seed and agricultural equipment	Seeding and farming equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	b2: Laboratory and field organization of grain seeds The student should be able to organize grain seeds	Calibrating and maintaining seed and agricultural equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
13	2	a1: The student is introduced to fertilization equipment The student should be able to know fertilization equipment	Fertilization equipment	Interactive lectures, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	b1: Calculates and organizes the amount of fertilizer needed per unit area The student must be able to operate and organize fertilization equipment	Calibration and maintenance of fertilization equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
14	2	a1: The student is introduced to the hydraulic sprinkler Pneumatic, disinfectants and mechanical control The student acquires knowledge and concepts related to pest control equipment	Control equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	b1: Calculates and regulates the amount of pesticide needed per unit area The student should be able to organize chemical control sprays	Calibrating and maintaining control equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
15	2	a2: The student learns about the combined grain harvester. The student should be able to know about harvesting equipment	Harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3	b3: Sustaining and maintaining harvesting equipment The student must be able to operate harvesting equipment	Sustaining and maintaining harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions

11- Course Evaluation				
	Evaluation methods	Evaluation date (week)	Grade	Relative weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five 2.5	2.5	2.5
3	Short test (1) Quiz	Week Six	2	2
4	Short Test (2) Quiz	Week Fourteen	2	2
5	Short Test (3) Quiz	Week Fifteen	1	1
6	Semester test (1)	sixth week	7.5	7.5
7	Semester test (2	the eleventh week	7.5	7.5
8	final theoretical exam final semester exams 40 40	final semester exams	40	40
9	Practical field project	week fifteen	5	5
10	Field evaluation	weeks three and five	2	2
11	short practical tests (1) Quiz	the first week	1	1
12	short practical tests (2) Quiz	Week Four	0.5	0.5
13	Short practical test (3) Quiz	Week Fourteen	1	1
14	Direct drawings and homework	weeks 6, 8, 9, 10, 11, 12, and 13	5.5	5.5
15	Final practical exams	Final semester exams	20	20
Total	100		100%	100%

11. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Agricultural tugs. Written by Dr. Abdel Salam Muhammad Ezzat and Lotfi Hussein Muhammad Ali. 2- Agricultural machines and machinery, written by Dr. Yassin Hashem Al-Tahan and Dr. Muhammad Jassim Al-Naama.
Main references (sources)	Agricultural mechanization (pullers and agricultural machines), written by Ahmed Al-Rai Imam Suleiman and Sami Muhammad Younis.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

The theoretical subject teacher:- Dr. Montaser Khairy Hussein

The practical subject teacher: M.M. .Laith Mahmoud Yahya

Chairman of the Scientific Committee: Prof. Dr. Alaa Muhammad Abdullah

Head of the Agricultural Economics Department: Prof. Dr. Alaa Muhammad Abdullah