Course Description Form

Mechanics of tractor performance

2. Course Code:

METP379

3. Semester / Year:

Second semester (spring)/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)

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8. Course Objectives

Course Objectives Graduating agricultural engineers and researchers to serve the agricultural sector. Scientific cooperation with agricultural directorates and other parties with the aim of improving agricultural production in quantity and quality. Investing in modern technology in the field of Mechanics of tractor performance in order to develop education, training and research programmes. Qualifying students to work according to the modern production system that relies on computers and information technology to operate. Preparing an advanced technical staff in the field of Mechanics of tractor performance design to meet the needs of society.

Strategy	

10. Course Structure					
Week	Hours	Required Learning	Unit or subject	Learning	Evaluation
		Outcomes	name	method	method
1	2	a2: Explains and clarifie	s The forces acting on	attendance	Exams, Reports,
	Theoretical	through lectures	the tractor at rest as well	lectures using	Quizzes,
			as in motion.	display devices:	Discussions

data shows, smart boards

			A 11 .1 1	T	E D
	3	c3: Solve mathematical	Applications and	Interactive	Exams, Reports,
	Practical	examples of the forces	mathematical problems	lecture, dialogue	Quizzes,
		acting on the tractor while	on the forces affecting	discussion, field	Discussions
		standing and moving	the tractor at rest and in	training and	
2			motion.	practical	
2	2	a2: Explains and clarifies	Soil strength – ultimate	attendance	Exams, Reports,
	Theoretical	through lectures	traction force.	lectures using	Quizzes,
				display devices:	Discussions
				data shows,	
				smart boards	
	3	c3: Solve mathematical	Applications and	Interactive	Exams, Reports,
	Practical	examples of soil strength	mathematical problems or	lecture, dialogue	Quizzes,
		- ultimate traction force.	soil strength - maximum	discussion, field	Discussions
			traction force.	training and	
				practical	
3	2	a2: Explains and clarifies	The relationship	attendance	Exams, Reports,
	Theoretical	through lectures	between real thrust	lectures using	Quizzes,
		-	force and maximum	display devices:	Discussions
			thrust force.	data shows,	
				smart boards	
	3	c3: Solve mathematical	Solving applied	Interactive	Exams, Reports.
	Practical	examples of slip, real and	mathematical problems	lecture, dialogue	Ouizzes,
		maximum thrust force.	about slip, real and	discussion, field	Discussions
		and soil cutting stress	maximum thrust force.	training and	
		and som catting stress	soil cutting stress	practical	
4	2	a2: Explains and clarifies	Exams reports quizzes	attendance	Exams Reports
•	Theoretical	through lectures	discussions	lectures using	Ouizzes
	Theoretical	unough lectures	uiseussions	display devices:	Discussions
				dete shows	Discussions
				amart boards	
	2	o2. Apply mothematical	Evene concette aviages	Internative	Exama Damanta
	Dra ati a al	c3: Apply mathematical	Exams, reports, quizzes,		Exams, Reports,
	Practical	examples from the	discussions	discussion field	Quizzes,
		previous topics		discussion, field	Discussions
				training and	
-				practical	5
5	2	a2: Explains and clarifies	The relationship	attendance	Exams, Reports,
	Theoretical	through lectures	between sliding and	lectures using	Quizzes,
			soil displacement.	display devices:	Discussions
				data shows,	
				smart boards	
	3	c3: Solve mathematical	Solve applied	Interactive	Exams, Reports,
	Practical	examples about the	mathematical problems	lecture, dialogue	Quizzes,
		relationship between	about the relationship	discussion, field	Discussions
		sliding and soil	between sliding and	training and	
		displacement	soil displacement	practical	
6	2	a2: Explains and clarifies	Coefficients (drag –	attendance	Exams, Reports.
	Theoretical	through lectures	push - rolling resistance)	lectures using	Ouizzes.
			efficiencies	display devices.	Discussions
			(drag - transport)	data shows	
			(and transport).	smart hoards	
	3	c3: Solve mathematical	Solve applied	Interactive	Exams Reports
	Practical	es. solve mathematical examples of coefficients	mathematical problems	lecture dialogue	Ouizzes
	Fractical	(drag push rolling	about the officiency of	discussion field	Quizzes,
		(urag - pusii - tollillig	about the efficiency of	training and	DISCUSSIONS
		resistance), enficiencies	withurawai, transfer,	training and	
-		(drag - transport).	and transactions	practical	5
7	2	a2: Explains and clarifies	Rolling resistance	attendance	Exams, Reports,
	Theoretical	through lectures	resulting from soil	lectures using	Quizzes,
			compaction and tire	display devices:	Discussions
			flattening	data shows,	
				smart boards	

	3 Practical	c3: Solve mathematical examples of rolling resistance	Solving applied mathematical problems about the rolling resistance resulting from soil compaction and tire flattening.	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
8	2 Theoretical	a2: Explains and clarifies through lectures	Methods used to determine the location of the center of gravity of the tractor (suspension balancing - weight).	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Solve mathematical examples of determining the center of gravity of a tractor	Solving applied mathematical problems about determining the center of gravity of the tractor	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
9	2 Theoretical	a2: Explains and clarifies through lectures	Forces affecting the machine while working with the agricultural tractor methods of attaching agricultural machinery to the tractor	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	b3: Field tests methods of attaching agricultural machines and the forces affecting on them	Field practice on attaching agricultural machines and the forces affecting on them	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
10	2 Theoretical	a2: Identify the devices and equipment used in mechanical inspection and testing of tractor	A field visit to workshops laboratories specialized in the inspection and safety of tractor	A lecture by technicians in specialized workshops and laboratories	Questions and reports about the visit
	3 Practical	b1: The student is shown t devices and equipment used in mechanical inspection and testing of the tractor	Skills in using devices and equipment used in mechanical inspection and testing of the tractor	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
11	2 Theoretical	a2: Explains and clarifies through lectures	Stability of tractor (longitudinal stability and transverse stability)	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Solve mathematical examples of the stability of a tactor	Solve mathematical problems about stability and the moments that act turning the tractor	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
12	2 Theoretical	a2: Explains and clarifies through lectures	Transmission systems (The mechanics of the clutch system).	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	b2: Field tests how the three points hatches system works	Field exercise on how the three points hatches system works	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
13	2 Theoretical	a2: Explains and clarifies through lectures	Types of gearboxes and methods of gearing.	attendance lectures using display devices:	Exams, Reports, Quizzes, Discussions

				data shows, smart boards	
	3	c3: Solve mathematical	Solving mathematical	Interactive	Exams, Reports,
	Practical	examples about the speed	problems about the speed	lecture, dialogue	Quizzes,
		of a tractor from the	a tractor based on revoluti	discussion, field	Discussions
		revolutions per minute	per minute and the	training and	
			number of teeth of the	practical	
			transmission gears	1	
14	2	a2: Explains and clarifies	Exams, reports, quizzes,	attendance	Exams, Reports,
	Theoretical	through lectures	discussions	lectures using	Quizzes,
				display devices:	Discussions
				data shows,	
				smart boards	
	3	c3: Apply mathematical	Exams, reports, quizzes,	Interactive	Exams, Reports,
	Practical	examples from the	discussions	lecture, dialogue	Quizzes,
		previous topics		discussion, field	Discussions
				training and	
				practical	
15	2	a2: Explains and clarifies	Mechanism of operation	attendance	Exams, Reports,
	Theoretical	through lectures	of the differential system	lectures using	Quizzes,
			- types of final reduction	display devices:	Discussions
			systems+ Hydraulic	data shows,	
			system.	smart boards	
	3	b2: The student	Practical and field	Interactive	Exams, Reports,
	Practical	experiences the process	practice for driving,	lecture, dialogue	Quizzes,
		of driving, braking, and	braking and pulling	discussion, field	Discussions
		pulling agricultural	agricultural machinery	training and	
		machinery in the field		practical	

1. Course Evaluation					
Seq.	Evaluating style	date	marks	Relative weight	
1	Final report: theoretical + practical	Theoretical: Week 13 Practical: week 13	7 theoretical + 6 practical	%13	
2	Monthly test 1	Week:4	4 theoretical + 2 practical	%6	
3	Monthly test 2	Week:14	10 theoretical + 5 practical	%15	
4	Quizzes	Week:12	4 theoretical + 2 practical	%6	
5	Final practical test	The week of the theoretical exam	20	%20	
6	Final theoretical test	The week of the Practical exam	40	%40	
	the total		100	%100	

2. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Mechanics of tractor performance. Dr. Shaker Hantoush Aday.
Main references (sources)	Basics of using agricultural machinery. Saad Ed Muhammad Amin
Recommended books and references (scientific journals, reports)	Basics of tractors and agricultural equipment. Dr. Lotfi Hussein.
Electronic References, Websites	https://www.youtube.com

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مدرس المادة العملي م. م. صالح صبري علي



رئيس قسم المكائن والألات الزراعية

أ.م. نوفل عيسي محيميد



Hts

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