

Course Description Form

1. Course Name:	
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)	
Name: Hussain Abed Hammood & Saleh Sabry Ali Email: hu_hamood@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> - 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.
9. Teaching and Learning Strategies	
Strategy	

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

	3 Practical	c3: Solve mathematical examples of the forces acting on the tractor while standing and moving	Applications and mathematical problems on the forces affecting the tractor at rest and in motion.	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
2	2 Theoretical	a2: Explains and clarifies through lectures	Soil strength – ultimate traction force.	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Solve mathematical examples of soil strength - ultimate traction force.	Applications and mathematical problems of soil strength - maximum traction force.	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
3	2 Theoretical	a2: Explains and clarifies through lectures	The relationship between real thrust force and maximum thrust force.	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Solve mathematical examples of slip, real and maximum thrust force, and soil cutting stress	Solving applied mathematical problems about slip, real and maximum thrust force, soil cutting stress	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
4	2 Theoretical	a2: Explains and clarifies through lectures	Exams, reports, quizzes, discussions	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Apply mathematical examples from the previous topics	Exams, reports, quizzes, discussions	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
5	2 Theoretical	a2: Explains and clarifies through lectures	The relationship between sliding and soil displacement.	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Solve mathematical examples about the relationship between sliding and soil displacement	Solve applied mathematical problems about the relationship between sliding and soil displacement	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
6	2 Theoretical	a2: Explains and clarifies through lectures	Coefficients (drag – push - rolling resistance) , efficiencies (drag - transport).	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions
	3 Practical	c3: Solve mathematical examples of coefficients (drag - push - rolling resistance), efficiencies (drag - transport).	Solve applied mathematical problems about the efficiency of withdrawal, transfer, and transactions	Interactive lecture, dialogue discussion, field training and practical	Exams, Reports, Quizzes, Discussions
7	2 Theoretical	a2: Explains and clarifies through lectures	Rolling resistance resulting from soil compaction and tire flattening	attendance lectures using display devices: data shows, smart boards	Exams, Reports, Quizzes, Discussions

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

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

مدرس المادة العملي
م. م. صالح صبري علي

مدرس المادة النظري
م. حسين عبد حمود

رئيس قسم المكنائز والآلات الزراعية
أ.م. نوفل عيسى محييميد

رئيس اللجنة العلمية
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