Course Description Form

1. Course Name:

Electrical systems of tractors

2. Course Code:

ELST479

3. Semester / Year:

First semester (autumn)/2025−2026

4. Description Preparation Date:

1/9/2025

5. Available Attendance Forms:

Combined (Attendance + distance education)

6. Number of Credit Hours (Total) / Number of Units (Total)

60 hours (30 theoretical hours + 30 practical hours) / 3 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 Electrical systems of tractors in order to develop education, training and research programmed. - Qualifying students to work according to the modern production system that relies on computers a information technology to operate. - Preparing an advanced technical staff in the field of agricultural tractor electrical maintenance to meet the needs of society.

9. Teaching and Learning Strategies

theoretical: -Interactive lecture. -Brainstorming. -Dialogue and discussion. -Assigning tasks and reports	practical: Assigning the student to inspect the components of electrical circuits within a specific period to reveal the student's skill ability. - Assigning the student to identify faults in electrical circuits and the possibility of repairing them to detect the change in the student's skill ability.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	a1: The student Identifies to the basic principles of agricultural tractor electricals	General electrical principles	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b1: The student experiences the practical principles of agricultural tractor electricals	Identify the student to the practical principles of agricultural tractor electricals	interactive lecture , and training	Discussion
2	2	a2: The student Identifies to	Lead acid battery	interactive lecture	Discussion

	Theoretical	the lead-acid battery, the theory of its operation, and maintain it		, Brainstorming, Dialogue and discussion	
	2 Practical	b2: The student examines the lead-acid battery and methods of maintaining it	Identify the student to the practical principles of battery inspection and maintenance	interactive lecture , and training	Discussion
3	2 Theoretical	a3: The student Identifies to the alkaline, lithium ion battery, the theory of operation, and maintain	alkaline, lithium ion battery	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b3: The student examines the alkaline, lithium ion battery and methods of maintaining.	Identify the student to the practical principles of battery inspection and maintenance	interactive lecture , and training	Discussion
4	2 Theoretical	a4: The student Identifies to the types of wires used in the electrical circuits of tractors, their specifications, and how to maintain them.	Electrical wires	interactive lecture , Brainstorming, Dialogue and discussion	quizzes
	2 Practical	b4: The student tests the electrical connections of wires terms of symbols and colors	Identify the student to the practical principles of inspecting and maintaining electrical circuits	interactive lecture , and training	A short practical test
5	2 Theoretical	a5: The student Identifies to the theory of direct current, generator components, and their maintenance	DC generator	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b5: The student will have practical experience examining and maintaining a direct current generator	Identify the student to the practical principles of inspecting and maintaining a D. C. generator	interactive lecture , and training	Discussion
6	2 Theoretical	a6: The student Identifies to the theory of alternating current, generator components, and their maintenance	A. C. generator	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b6: The student has practical experience examining and maintaining an alternating current generator	Identify the student to the practical principles of inspecting and maintaining an A.C. generator	interactive lecture , and training	Discussion
7	2 Theoretical	a7: It identifies the starter motor, its faults and maintenance, and the electric motor for agricultural tractors.	Starter and electric motor for agricultural tractors	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b7: The student tests the connection and maintenance of the starter motor and electric motor parts in the tractor.	Practical principles for testing the starter motor and electric motor.	interactive lecture , and training	Discussion
8	2 Theoretical	a8: The student learns about the theory of relay operation. c1: determine the skill levels acquired by each student	relay + First monthly exam	Interactive lecture + test	Class test
	2 Practical	b8: The student uses a relay in different electrical circuits. c2: determine the skill levels acquired by each student	relay + First monthly exam	Interactive lecture + test	practical test
9	2 Theoretical	a9: The student Identifies to the types of lamps used in agricultural tractors, their installation, and how they	Light bulbs	interactive lecture , Brainstorming, Dialogue and discussion	quizzes

		work			
	2 Practical	b9: The student uses appropriate equipment to inspect and maintain lamps	Identify the student to the practical principles of inspecting and maintaining lamps	interactive lecture , and training	A short practical test
10	2 Theoretical	a10: The student Identifies to the devices and equipment used in repairing tractor malfunctions	A field visit to specialized repair workshops	A lecture by technicians in the repair shop	Discussion
	2 Practical	b10: The student applies safety and security principles in the repair shop	Identify the student to the practical principles of safety security while working in workshops	interactive lecture , and training	reports about the visit
11	2 Theoretical	a11: The student Identifies to theory of operation of the electric ignition system, its malfunctions, and maintenance	Electric ignition system	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b11: The student uses appropriate equipment to inspect and maintain the electrical ignition system	Identify the student to the practical principles of inspecting and maintaining the electrical ignition system	interactive lecture , and training	Discussion
12	2 Theoretical	a12: The student Identifies to the side signal electrical circuit	Side signals	interactive lecture , Brainstorming, Dialogue and discussion	report
	2 Practical	b12: The student will have practical experience examining and maintaining the side signal circuit	Identify the student to the practical principles of inspecting and maintaining electrical circuits for side signals	interactive lecture , and training	report
13	2 Theoretical	a13: The student Identifies to the types of indicators on the tractor's dashboard and the theory of its operation and maintenance	Electrical indicators	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b13: The student explains the types of indicators and methods of inspecting and maintaining them	Identify the student to the practical principles of inspecting and maintaining the dashboard of tractor	interactive lecture , and training	Discussion
14	2 Theoretical	a14: The student Identifies to the theory of sound generation horn, its installation, and its malfunctions	The horn	interactive lecture , Brainstorming, Dialogue and discussion	Discussion
	2 Practical	b14: The student tests the horn methods of checking and maintaining it	Identify the student to the practical principles of checking and maintaining a horn	interactive lecture , and training	Discussion
15	2 Theoretical	a15: The student learns about the types of fuses. c3: determining the skill levels acquired by each student	The fuses + The second monthly exam	Interactive lecture + test	Class test
	2 Practical	b15: The student explains the types of fuses, their inspection maintenance. c4: determining the skill levels acquired by each student	The fuses + The second monthly exam	Interactive lecture + test	practical test

11.Course Evaluation

Seq.	Evaluating style	date	marks	Relative weight
1	Final report: theoretical + practical	Theoretical: Week 12 Practical: week 12	7 theoretical + 6 practical	%13

2	Monthly test 1	Week:8	4 theoretical + 2 practical	%6
3	Monthly test 2	Week:15	10 theoretical + 5 practical	%15
4	Quizzes	Continuous	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

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Agricultural tractor repair, Dr. Muhammad Jassim Al-Naama, 1992
Main references (sources)	Maintenance and Repair, Ali Saleh Al-Najjar, 1981
Recommended books and references (scientific journals, reports...)	- The battery as you never knew it before, Ahmed Mohieddin Attia 2013 -Automotive Electricity, Ministry of Education, Syrian Arab Republic, 2018
Electronic References, Websites	https://www.youtube.com

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