Course Description Form

1. Course Name:
Hydraulic Equipment
2. Course Code:
HYEQ477
3. Semester / Year:
first semester 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)
30 theoretical hours +45 practical hours =75 hours
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.i **Amar Waeel**
8. Course Objectives
1- Identify hydraulic systems, their types, and their uses in the field of agricultural machinery **2- Identify the basic hydraulic systems and their main functions, identify their malfunctions, an how to calibrate them.** **3- Identify the advantages and disadvantages of hydraulic systems of various types** **4- Identify the correct operational methods for each type of hydraulic system** **5- Acquiring knowledge in methods of sustaining, maintaining and repairing parts of basic hydraulic systems.** **6- Gaining the ability to keep pace with developments in hydraulic systems represented by adopting modern methods.** **7- Acquire knowledge and ability in how to develop the hydraulic systems used and prove their efficiency when applied.** **8- Acquiring knowledge in the applications of types of hydraulic systems in various agricultural and heavy machinery.** **9- The ability to diagnose hydraulic system malfunctions** **10 - Possibility of calibrating parts of the hydraulic system** **11- How to choose the appropriate systems according to the variables in the crisis** **12- Gaining skill in using modern hydraulic systems.** **13- The ability to design and manufacture hydraulic systems to serve and develop the mechanized sector**
9. Teaching and Learning Strategies
1-Interactive lecture **2-Brainstorming**

3-Dialogue and discussion
4-Field Training
5-Practical exercises
6-Field project
7-Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical	a2 understands pascal's rule law a1 knows hydraulic basics	Introduction to hydraulic fundamentals and derivation of Pascal's rule law	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about pascal's rule	Practical applications and experiments on Pascal's rule	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
2	2 theoretical	a2 understands the components of the hydraulic system a2 knows what distributors and command and control systems are	Hydraulic system components, distributors, command and control systems	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 applies and experiments what he has learned about hydraulic distributors and control systems	Practical applications and experiments on Distributors and hydraulic control systems	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
3	2 theoretical	a2 understands the types of hydraulic fluids a2 and knows its specifications and uses	Types of hydraulic fluids, their specifications and uses	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic fluids	Practical applications and experiments on Hydraulic fluids	Interactive lecture, brainstorming, dialogue and discussion, field	Short daily test1 Semester test1 Final test

				training, and self-learning	
4	2 theoretical	a2 understands what hydraulic motors are and their uses a2 defines and classifies its types	Definition and classification of types Hydraulic motors and their uses	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic motors	Practical applications and experiments on Hydraulic motors	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
5	2 theoretical	a2 understands what hydraulic pumps are a2 defines the types, parts, and mechanism of action	Definition and classification of hydraulic pumps (Types_parts_mechanism of action)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic pumps	Practical applications and experiments on Hydraulic pumps	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
6	2 theoretical	a2 understands what hydraulic valves are a2 defines the types, parts, and mechanism of action	Definition and classification of types Hydraulic valves (Types_parts_mechanism of action)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic valves	Practical applications and experiments on Hydraulic valves	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
7	2 theoretical	a2 understands what hydraulic cylinders are a2 defines the types used in agricultural machinery	Definition and classification of hydraulic cylinders and examples in Cylinders used in agricultural machinery	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic cylinders	Practical applications and experiments on hydraulic cylinders	Interactive lecture, brainstorming, dialogue and discussion, field	Short daily test1 Semester test1 Final test

				training, and self-learning	
8	2 theoretical	a2 understands what hydraulic torque converters are c1 and calculate the moments transferred through it	Hydraulic moment converters and mathematical questions about them	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 applies and experiments what he has learned about hydraulic torque converters	Practical applications and experiments on hydraulic torque converters	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
9	2 theoretical	a2 understands what oil tanks, oil coolers and hydraulic isolators are	Oil tank, oil coolers and hydraulic isolators	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about the oil tank, oil coolers and hydraulic isolators	Practical applications and experiments on oil tanks, oil coolers and hydraulic insulators	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
10	2 theoretical	a2 understands the meaning of open hydraulic system a1 and knows its types and features	Hydraulic systems (open system, types and features)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about the open hydraulic system	Practical applications and experiments on Open hydraulic system	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
11	2 theoretical	a2 understands the meaning of a closed hydraulic system a1 and knows its types and features	Types of hydraulic systems (Closed system, its types and advantages)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about the closed hydraulic system	Practical applications and experiments on Closed hydraulic system	Interactive lecture, brainstorming, dialogue and discussion, field	Short daily test1 Semester test1 Final test

				training, and self-learning	
12	2 theoretical	a2 understands hydraulic systems in agricultural machinery a1 knows how to use it	Use of hydraulic systems in agricultural machinery	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic systems in agricultural machinery	Practical applications and experiments on hydraulic systems in agricultural machinery	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
13	2 theoretical	a2 understands hydraulic systems in heavy equipment a1 knows how to use it	Use of hydraulic systems in heavy equipment	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 apply and experiment with what you have learned about hydraulic systems in heavy equipment	Practical applications and experiments on Hydraulic systems in heavy equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
14	2 theoretical	a2 understands the laws and mathematical calculations of hydraulic systems	Mathematical basics about Hydraulic systems	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	a3 calculates and c1 solves various mathematical exercises and problems about hydraulic systems	Exercises for Hydraulic systems	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
15	2 theoretical	a2 understands the meaning and how to maintain and maintain equipment hydraulic a2 knows how to maintain and maintain	Maintenance and maintenance of equipment Hydraulic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 applies and experiments with what he has learned about maintaining and	Practical applications and experiments on maintaining and	Interactive lecture, brainstorming, dialogue and discussion, field	Short daily test1 Semester test1 Final test

		maintaining hydraulic equipment	**sustaining hydraulic equipment**	**training, and self-learning**	

1. Course Evaluation

Seq.	Evaluating style	date	marks	Relative weight
1	Home reports	every week	10	10%
2	Short tests	every week	10	10%
3	Semester test 1	The seventh week	10	10%
4	Semester test 2	The final week	10	10%
5	Final practical test	End of the course	20	20%
6	Final theoretical test	End of the course	40	40%
	the total		100	100%

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1- أسس تصميم وصيانة النظم الهيدروليكية . محمد شيخو معمو.شعاع للنشر والعلوم 09 2- أسس الآلات الهيدروليكية (تقنية آلات زراعية) . المؤسسة العامة للتعليم الفني والتدريب المهني 3- هيدروليكية المكائن الزراعية. عبدالجبارخلف الجميلي وعبدالعزيز عباس عزيز1992 4- التحكم الهيدروليكي وتطبيقاته . أحمد عبدالمتعال .دار النشر للجامعات 1997
Recommended books and references (scientific journals, reports...)	1- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007, 2st Addition, SAK Publisher , Press in 2007 2- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007,1 st Addition, SAK Publisher , Press in 2007 3- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007, 2st Addition, SAK Publisher , Press in 2007 4- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007,1 st Addition, SAK Publisher , Press in 2007
Electronic References, Websites	**https://www.youtube.com**

مدرس المادة النظري
م.أحمد محمدأمين سعيد

مدرس المادة العملي
م.م.عمار وائل

رئيس اللجنة العلمية
أ.د. أركان محمدأمين صديق

رئيس قسم المكائن والآلات الزراعية
أ.م.نوفل عيسى محيميد

جامعة الموصل
كلية الزراعة والغابات
قسم
المكائن والآلات الزراعية