Course Description – Internal combustion engines

1. Course Name:
Internal combustion engines
2. Course Code:
INCE384
3. Semester / Year:
second semester/ third Class / 2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
Presence + on line
6. Number of Credit Hours (Total) / Number of Units (Total)
Theory (2 hours)- practice (3 hours) (5 hours)/ 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Firas Salah Yahya Email: firas.alkhayatt@uomosul.edu.iq Shamil Mohammed Saleh eng.sh.hassn@uomosul.edu.iq
8. Course Objectives
The student's familiarity with reciprocating internal combustion engines, their parts, and their operating mechanism, and understands the theoretical foundations of their operation, through which their performance standards are understood to distinguish between different engines to perform a specific task. Pollutants emitted from these engines are also studied.
9. Teaching and Learning Strategies
- Interactive lecture - Brainstorming - Dialogue and discussion - Practical exercises - Self-education
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theory	a1,a2: Remembers and understands internal combustion engines	Introduction to internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 practice	a1,a2: Remembers and understands internal combustion engines	Learn about engines by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
2	2 Theory	a1,a2: Remembers and understands the topic	Classification of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
3	2 Theory	a1,a2: Remembers	Classification of	Interactive lecture,	Exams

		and understands the topic	internal combustion engines	brainstorming, dialogue and discussion	
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
4	2 Theory	a1,a2: Remembers and understands the topic	Basic concepts of reciprocating engines	Interactive lecture, brainstorming, dialogue and discussion	Exams,
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
5	2 Theory	a1,a2: Remembers and understands the topic	Four-stroke and two-stroke engine cycles and its comparison	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
6	2 Theory	a1,a2: Remembers and understands the topic	Basic components of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
7	2 Theory	a1,a2: Remembers and understands the topic	Basic components of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
8	2 Theory	a1,a2: Remembers and understands the topic	Basic components of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
9	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Engine cycles (Otto cycle)	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue	Exams, homework

		related to the topic		and discussion, self-learning	
10	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Engine cycles(Diesel and dual cycle)	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
11	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Criteria of performance of I.C. engines	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
12	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Criteria of performance of I.C. engines	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
13	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Combustion and its types and chemical equations	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
14	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Combustion and its types and chemical equations	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
15	2 Theory	a1,a2: Remembers and understands the topic	Pollution by I.C. engines	Interactive lecture, brainstorming, dialogue and discussion	Exams,
	3 Practice	a2,a3: Understands and solves problems related to the combustion topic	Solve problems related to the combustion topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework

11. Course Evaluation			
Theory	practice	Final Exam	Total

25% -Exams -Presence	15% - Exams - Homework	60%	100%
12. Learning and Teaching Resources			
Required textbooks (curricular books, if any)		محركات احتراق داخلي ، د. يوسف العاني ، الطبعة الاولى ، دار الحكمة للطباعة والنشر ، 1990	
Main references (sources)		- Internal Combustion engines, John B. Heywood, McGraw-Hill, 1989 - Internal Combustion engines, Cohn R. ferguson & Allan T. Kirkpatrick, 2nd ed., John Wiley and Sons, 2001	
Recommended books and references (scientific journals, reports...)		------	
Electronic References, Websites		------	

مدرس المادة العملي: م. شامل محمد صالح

مدرس المادة النظري: م. فراس صلاح يحيى

رئيس القسم: أ.م. توفل عيسى محيميد

رئيس اللجنة العلمية: أ.د. عادل احمد عبد الله

Course Description – Thermodynamics

1. Course Name:

Thermodynamics

2. Course Code:

THER376

3. Semester / Year:

First semester/ Third Class / 2024-2025

4. Description Preparation Date:

1/2/2025

5. Available Attendance Forms:

Presence + on line

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

Theory (2 hours)- practice (3 hours) (5 hours)/ 3.5 units

7. Course administrator's name (mention all, if more than one name)

Name: Firas Salah Yahya Email: firas.alkhayatt@uomosul.edu.iq
Shamil Mohammed Saleh eng.sh.hassn@uomosul.edu.iq

8. Course Objectives

To study the relationship between heat, work, and the properties of materials, such as gases and vapors, within the boundaries of the thermal system, so that the student will later have a broad understanding of the work of thermal systems, whether thermal systems that produce or consume energy.

9. Teaching and Learning Strategies

- Interactive lecture
- Brainstorming
- Dialogue and discussion
- Practical exercises
- Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theory	a1,a2: Remembers and understands the basics of thermodynamics	Basic concepts of thermodynamics	Interactive lecture, brainstorming, dialogue and discussion	Exams,
	3 practice	a1,a2: Remembers and understands the basics of thermodynamics	Learn about some thermal systems by watching videos	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams,
2	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Pressure and its types	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
3	2 Theory	a1,a2,a3: Remembers, understands and solves	Density, specific weight, and	Interactive lecture, brainstorming, dialogue and	Exams, homework

		examples related to the topic	temperature and its types	discussion	
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
4	2 Theory	a1,a2: Remembers, understands the topic	Zeroth law of thermodynamics, reversibility and pure substance	Interactive lecture, brainstorming, dialogue and discussion	Exams,
	3 Practice	a2,a3: Understands and solves problems related to the previous topic	Solve problems related to the previous topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
5	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Energy and its types	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
6	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Perfect gas laws	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
7	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Perfect gas laws	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
8	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	First law of thermodynamics and it application on closed and open systems	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
9	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	First law of thermodynamics and it application on closed and open systems	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
10	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Reversible processes of thermodynamics for closed systems	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
11	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Reversible processes of thermodynamics for closed systems	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
12	2 Theory	a1,a2,a3: Remembers,	Second law of	Interactive lecture,	Exams,

		understands and solves examples related to the topic	thermodynamics, entropy and thermal processes	brainstorming, dialogue and discussion	homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
13	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Second law of thermodynamics, entropy and thermal processes	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
14	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Gas mixtures	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
15	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Gas mixtures	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework

11. Course Evaluation

Theory	practice	Final Exam	Total
25% -Exams -Presence	15% - Exams - Homework	60%	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	- Fundamentals of engineering thermodynamics, John R. Howell & Richard O. Buckius, 1st ed. , McGraw-Hill, 1987.
Main references (sources)	- Thermodynamics: engineering approach, Yunus A. Cengle & Michael A. Boles, 5th ed., McGraw-Hill, 2005. - Thermodynamics for engineers, Schaum's outlines, MERLE C. POTTER, Ph,D., 1993.
Recommended books and references (scientific journals, reports…)	------
Electronic References, Websites	------

مدرس المادة العملي: م. شامل محمد صالح

مدرس المادة النظري: م. فراس صلاح يحيى

رئيس القسم: أ.م. نوفل عيسى حميد

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Course Description Form

1. Course Name:
Animal Production Mechanization
2. Course Code:
ANPM224
3. Semester / Year:
First Semester Autumn 2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
Physical
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours of theory and 3 hours of practical, for 15 weeks, making a total of 75 hours / 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name of Lecturer for Theory part: Dr. Rafea Abdulsattar Mohammed Email: rafea-machine@uomosul.edu.iq Name of Lecturer for practical part: Mr. Othman Muayyad Muhammad Tawfiq
8. Course Objectives
Course Objectives
Theoretical - The student understands the importance of livestock and their mechanization. - The student must be familiar with the concept of the operation of all equipment and machines used in animal shelters. - The student should be able to invest agricultural machinery and equipment in promoting animal products - The student must be able to manage and supervise the farm.
Practical - The student should be familiar with the methods of operating and maintaining equipment and machinery in animal pens. - The student should be aware of the risks to which he is exposed when using machines in barns. - The student must be able to carry out all experiments and special work on equipment and machines in animal pens. - The student must be fully aware of the responsibility of maintaining the farm and the processes necessary for that. - The student must have practical experience in managing animal pens and investing in the farm in the best possible way.
9. Teaching and Learning Strategies
Strategy

Strategy theory part	- Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting

	- Displaying real models of orchard mechanization equipment and machines
Strategy practical part	- Assigning group work to reveal leadership skills - Assigning individual tasks to reveal personal skills - Assigning reports on practical experiments and field tasks

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	a1: Identify the types of animal pens according to the type of animal or type of breeding	Animal barns and breeding systems	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Assigned a task
	3 practic	b1: Examination of the soil in which the farm or animal pens will be constructed b3: Check the water available on site	Site selection requirements	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
2	2 Theoretical	a2: Identify harmful gases in the barn a3: Identify the mechanisms of expelling gases and humidity and ventilating the barn	Controlling environmental conditions in barns (ventilation)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b2: Practice operating and maintaining the ventilation fan c1: Fan discharge calculation	Determine and calculate ventilation	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
3	2 Theoretical	a4: Identify the idea of the cooling system a5: Identify the mechanisms for cooling the barn atmosphere	Controlling environmental conditions in barns (cooling)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b3: Training in operating and maintaining cooling systems c2: Calculating the cooling efficiency of cooling systems	Operating and maintaining cooling systems	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
4	2 Theoretical	a6: Identify the concept of heating a7: Identifying the mechanisms for heating the atmosphere or floor of the barn	Controlling environmental conditions in barns (heating)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b4: Training in operating and maintaining heating systems b5: Regulating	Operating and maintaining heating systems	Interactive lecture, brainstorming, dialogue and discussion, field	Assign an assignment and a short test

		temperatures in the barn		training, and self-learning	
5	2 Theoretical	a6: Identify water sources and pumps and Identify tanks, transportation pipes, drinking water nozzles, and drippers	Mechanization of water supply	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b6: Practice operating the water pumping station on the farm b7: Maintenance of the water pumping station	Problems and maintenance of the water pumping station to the farm	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
6	2 Theoretical	a7: Calculate the amount of water needed for the farm	Calculating the water need on the farm	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	c3: Applying the calculation of water needs on the farm	Calculating the water need on the farm	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
7	2 Theoretical	a8: Identifying the types of feeders according to the types of breeding systems or animal pens and Identify the idea of how mechanisms for providing dry and withered fodder work	Feeders and feed presenting equipment	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b8: Training to operate feed presenting equipment b9: Maintenance of feed serving equipment	Operating and maintaining feed serving equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
8	2 Theoretical	a9: Identify the idea of working waste disposal mechanisms inside barns and Identify means and mechanisms for storing and treating waste and deploying them in the field	Removal equipment of Animal manure	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b10: Practice operating waste disposal equipment c4: Apply waste abatement calculations and practice equipment maintenance	Operating and maintaining manure disposal equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
9	2 Theoretical	a10: Identify the concept of shearing wool and Identify the	Mechanization of wool shearing	Interactive lecture, brainstorming,	Semester test And a short test

		types of wool shearing machines		dialogue and discussion, self-learning	
	3 practical	b11: Training in operating and maintaining wool shearing equipment	Operating and maintaining wool shearing equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Semester test And a short test
10	2 Theoretical	a11: Identify the concept of extracting milk from the udder and Identify the stages of milking a cow	Automated milking and cow milking	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b12: Practice operating and maintaining the milking machine	Operating and maintaining the milking machine	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
11	2 Theoretical	a12: Identify the types of milking systems and milking halls	Milking systems and milking halls	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b13: Training in operating and maintaining milking halls	Operation and maintenance of milking halls	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
12	2 Theoretical	a13: Identifying the conditions for preparing eggs for hatching and the types of hatcheries and incubators	Egg hatchery equipment	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b14: Training on operating and maintaining hatcheries and chick incubators	Operating and maintaining hatcheries	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
13	2 Theoretical	a14: Identify the mechanisms of collecting and detecting table eggs and packaging equipment	Egg handling and transportation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Assignment of a report discussions assignment and a short test
	3 practical	b15: Training in operating and maintaining egg transport and handling equipment	Operating and maintaining table egg transport and handling equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and	Assignment of a report discussions assignment and a short test

				self-learning	
14	2 Theoretical	a15: Identifying the mechanisms and stages of poultry reflux and Identifying the mechanisms and stages of livestock slaughter	Slaughtering and handling of meat	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b16: Practice operating animal island equipment b17: Training in operating meat handling and processing equipment	A visit to the typical Mosul massacre	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Assign an assignment and a short test
15	2 Theoretical	a16: Mechanisms and equipment for cooling and preserving animal products	Cooling and preserving animal products	Interactive lecture, brainstorming, dialogue and discussion, self-learning	quiz
	3 practical	b18: Training in operating and maintaining equipment for cooling and preserving animal products	Operating and maintaining equipment for cooling and preserving animal products	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Discussions and a short test

11. Course Evaluation		
Theoretical evaluation method	evaluation date	evaluation degree
Monthly test	Week 9	10 %
Quiz	Weeks 1-15	10 %
Report	Week 13	5 %
total	25 %	
Practical evaluation method	evaluation date	evaluation degree
Monthly test	Week 9	5 %
Quiz and assignment	Weeks 1-15	2 + 3 = 5 %
Report	Week 13	5 %
total	15 %	
Theoretical + practical semester endeavor (25+15)	After 15 week	40 %
Final practical exam	20 %	20%
Final Theoretical exam	40 %	40%
Final degree	100 %	100 %

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Al-Naama, Muhammad Jassim (1990) Mechanization of Animal Production, Mosul University Press. Iraq
Main references (sources)	Azza, Abdul Salam and Tawfiq Fahmi (1900) Animal production mechanization equipment,

	Baghdad University Press. Iraq Stout, Bill A. (1990) CIGR Handbook of Agricultural Engineering, Volume III, *ASAE*, USA.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Food and Agriculture Organization FAO

Teacher of Theoretical part
Dr. Rafea Abdulsattar Mohammed-nori

Chairman of the Scientific Committee
prof. dr. Adel Ahmed

Teacher of Practical part
Mr. Othman Muayyad Muhammad Tawfiq

Head of agricultural machines and Equipment
الاستاذ المساعد
نوفل عيسى مجيميد

Course Description Form

1. Course Name:
Orchard Machinery and Crop service
2. Course Code:
OMCS 381
3. Semester / Year:
Second Semester (Spring) 2024-2025
4. Description Preparation Date:
1-2-2025
5. Available Attendance Forms:
Physical
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours of theory and 3 hours of practical, for 15 weeks, making a total of 75 hours / 3.5 units.
7. Course administrator's name (mention all, if more than one name)
Name of Lecturer for Theory part: Dr. Rafea Abdulsattar Mohammed Email: rafea-machine@uomosul.edu.iq Name of Lecturer for practical part: Mr. Ammar Wael Saleh
8. Course Objectives
Course Objectives for theory part
- The student understands the importance of green cover and the role of forests in protecting the climate. - The student must be familiar with the concept of the work of all equipment and machines used in reclamation and establishment of an orchard. - The student should understand how to plant forest trees and sustain them through orchard service cultivation equipment. - The student should be able to invest in the orchard's products, including fruits and vegetables, as well as harvest tree trunks and process their wood in the orchard before transporting them to the factory. - The student must be able to manage and supervise an orchard
Course Objectives for practical part
- The student must be familiar with the methods of operating and maintaining orchard reclamation and construction equipment. - The student should be aware of the risks to which he is exposed when using machines in the orchard. - The student must be able to carry out all the experiments and work related to planting and serving the orchard. - The student must be fully aware of the responsibility of preserving the orchard from pests and fires and apply the necessary processes for this. - The student must have practical experience in orchard management and investment in farm

products.

9. Teaching and Learning Strategies

Strategy of theory part	- Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting - Displaying real models of orchard mechanization equipment and machines
Strategy of practical part	- Assigning group work to reveal leadership skills - Assigning individual tasks to reveal personal skills - Assigning reports on practical experiments and field tasks

10. Course Structure

Theoretical part

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	a1, a2: The student identifies and learns about the requirements for choosing a land site to establish an orchard e1: Encourages spreading awareness about the importance of plant cover and the sustainability of orchards	Principles of choosing a land location and establishing the orchard	Dialogue and writing style on smart board	Discussions and short quiz
2	2	a3: The student learns about the types of tractors for orchards c1: The student determines the specifications of orchard tractors	Orchard tractors and their specifications	Dialogue and writing style on smart board	Discussions and short quiz
3	2	a4: The student learns what reclamation equipment is? c2: Choosing the most appropriate method for each land preparation	Equipment for land reclamation in small and large orchards	Dialogue and writing style on smart board	Discussions and short quiz

		process			
4	2	a5: The student learns what soil preparation equipment is? c4: Choose the most suitable soil preparation	Soil preparation equipment for orchards	Dialogue and writing style on smart board	Discussions and short quiz
5	2	a6: The student learns about the principle of making plants and seedlings c5: Which one is most appropriate according to the purpose of agriculture	Planters and seedlings of vegetable crops and fruit trees	Dialogue and writing style on smart board	Discussions and short quiz
6	2	a7: The student learns the principle of working of excavators for planting seedlings c6: Which of them is most suitable for planting cuttings and shrubs?	Drilling equipment for tree cuttings	Dialogue and writing style on smart board	Discussions and short quiz
7	2	a8: The student learns about fertilization processes and the concept of sprinkler or drip irrigation c7: The water discharge for the irrigation system is calculated	Technological processes, irrigation and fertilization systems	Dialogue and writing style on smart board	Discussions and short quiz
8	2	a9: The student learns about the working principle of pest control machines c8: Explain how it can be used to extinguish fires	Pest control and fire prevention equipment	Dialogue and writing style on smart board	Discussions and short quiz
9	2	a10: The student learns about the principle of operation of pruning and trimming machines	Branch pruning and trimming equipment	Dialogue and writing style on smart board	Discussions and short quiz

		c9: Explain how to choose the most appropriate machine			
10	2	a11: The student learns about the concept of cutting c10: Determine tree fall calculations	Equipment for cutting logs	Dialogue and writing style on smart board	Discussions and short quiz
11	2	a12: The student learns the concept of transportation c11: Explain how to determine the types of log transport equipment	Equipment for transporting logs	Dialogue and writing style on smart board	Discussions and short quiz
12	2	a13: The student learns the principle of operation of tree uprooting and stump processing machines c12: Explains which method is most suitable for removing tree remains	Equipment, extraction and processing of tree bark	Dialogue and writing style on smart board	Discussions and short quiz
13	2	a14, c13: The student recognizes and shares the ethical responsibility to preserve and maintain forest trees and orchards and personal safety when handling machinery.	A field visit to the forests of Mosul	Style of dialogu and discussion	Discussion report and short test
14	2	a15: The student learns about the concept of the work of vegetable harvesters c14: Shows how to calculate productivity	The student understands the concept of the work of vegetable harvesters	Dialogue and writing style on smart board	Discussions and short quiz
15	2	a16: The student learns about the concept of the work of fruit harvesters	Fruit harvesting equipment	Dialogue and writing style on smart board	Discussions and short quiz

		c15: Shows how to calculate productivity			
Practical part					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning meth**	**Evaluation meth**
1	3	b1: Gains experience in driving and maintaining a tractor d1:Takes advantage of the capabilities of the tractor on the farm	Operating and maintaining the agricultural tractor	Assigning practi tasks	Discussions and short quiz
2	3	b2: The student applies the processes of leveling and amending orchard land with appropriate equipment	Calibration and maintenance of Orchard land Reclamation equipment	Assigning practi tasks	Discussions and short quiz
3	3	b3: Gains experience in attaching, operating and organizing plows	Calibration and maintenance Primary tillage equipment	Assigning practi tasks	Discussions and short quiz
4	3	b4: Gain experience in connecting, operating and organizing smoothing equipment	Calibration and maintenance Secondary tillage equipment	Assigning practi tasks	Discussions and short quiz
5	3	b5: The student applies the process of operating and organizing seeds and seedlings	Calibration and maintenance of Seeds and seedlings	Assigning practi tasks	Discussions and short quiz
6	3	b6: Gain experience in connecting and operating gore excavators	Organizing and maintaining Drilling equipment	Assigning practi tasks	Discussions and short quiz
7	3	b7: Gains experience in operating and organizing fertilization and irrigation	Organizing and maintaining Fertilization and Irrigation equipment	Assigning practi tasks	Discussions and short quiz

		equipment			
8	3	b8: Gains experience in connecting, operating and organizing control machines c1: Calculates the spray rate of the sprinkler	Calibration and maintenance of Pest and fire control equipment	Assigning practi tasks	Discussions and short quiz
9	3	b9: Gains experience in attaching, operating and organizing pruning and trimming equipment	Organize pruning and trimming equipment	Assigning practi tasks	Discussions and short quiz
10	3	b10: Gain experience in connecting, operating and organizing equipment for cutting and dropping tree trunks	Organizing and maintaining cutting equipment	Assigning practi tasks	Discussions and short quiz
11	3	b11: Gains experience in attaching, operating and organizing log processing and transport equipment	Organizing and maintaining transport equipment	Assigning practi tasks	Discussions and short quiz
12	3	b12: Acquires experience in connecting, operating, and organizing equipment for uprooting and removing stumps and tree remains	Organizing and maintaining equipment for extracting and processing tree stumps and remains	Assigning practi tasks	Discussions and short quiz
13	3	b13: Gains experience in safety and applying the stages of servicing the orchard or forest land	A field visit to the forests of Mosul	Style of dialogu and discussion	Discussion of the report and a short test
14	3	b14: Gains experience in connecting,	Organizing and maintaining vegetable	Assigning practi tasks	Discussions and short quiz

		operating and organizing vegetable harvesters	harvesting equipment		
15	3	b15: Gains experience in attaching, operating and organizing fruit harvesters	Organizing and maintaining fruit harvesting equipment	Assigning practi tasks	Discussions and short quiz

11.Course Evaluation

Theoretical evaluation method		evaluation date	evaluation degree
1-	Monthly test	Week 9	10 %
2-	Quiz	Weeks 1-15	10 %
3-	Report	Week 13	5 %
total			25 %
Practical evaluation method		evaluation date	evaluation degree
1-	Monthly test	Week 9	5 %
2-	Quiz and assignment	Weeks 1-15	2 + 3 = 5 %
3-	Report	Week 13	5 %
total			15 %
1-	Theoretical + practical semester endeavor (25+15)	After 15 week	40 %
2-	Final practical exam		20 %
3-	Final Theoretical exam		40 %
4-	Final degree		100 %

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Al-Sabbagh, Abdul Rahman Ayoub (1990). Tractors and Mechanization of Orchards, Mosul University edition, Iraq.
Main references (sources)	Stout, Bill A. (1990) CIGR Handbook of Agricultural Engineering, Volume III, ASAE, USA.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Food and Agriculture Organization (FAO)

Teacher of Theoretical Part
Dr. Rafea Abdulsattar Mohammed-nori

Teacher of Practical Part
Mr. Ammar Wael Saleh

Chairman of the Scientific Committee
Prof. dr. Adel Ahmed

Head of Agricultural Machines and Equipment

جامعة الموصل
كلية الزراعة والغابات
الاستاذ المساعد
قسم المكائن والالات الزراعية

Course Description Form

1.	Course Name:
	Design of Agricultural Machinery
2.	Course Code:
	DAMA383
3.	Semester / Year:
	second course 2024-2025
4.	Description Preparation Date:
	1/2/2025
5.	Available Attendance Forms:
	Attendance + Online
6.	Number of Credit Hours (Total) / Number of Units (Total)
	75 hours /3.5 units
7.	Course administrator's name (mention all, if more than one name)
	Letcher: Dr. Mohammed Hussin Ahmed Al-Mola Email: dr.mohammedalmola@uomosul.edu.iq Letcher: Shamil Mohammed Saleh Hassan Email: eng.sh.hassn@uomosul.edu.iq
8.	Course Objectives
	- Enabling the student to know the style of design philosophy - Introducing the student to the importance and role of designing machine parts in practical life - Delve deeper into the concepts of optimal design through a study - Special scientific concepts for designing equipment and machines for machines - Enabling the student to solve problems using mathematical concepts related to engineering problems regarding the load on the machine or piece through stresses, strains, shocks, torsion, and other influencing factors.
9.	Teaching and Learning Strategies
	1. Students are presented with a problem or issue related to the subject matter for them to analyze and solve on their own. 2. Discussions, presentations, and simulations are used to promote active student engagement. 3. Students are divided into groups to solve problems. 4. Digital tools such as recorded lectures, online platforms, and virtual reality are used to support learning. 5. Quizzes, assignments, and discussions are provided to continuously assess students' comprehension of the material.
10.	Course Structure

Week	Hours/ lecture type	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2/ Theoretical	a1: getting to Know the design concept and the things that should to be taken into consideration when designing	Theoretical: An introduction to science the design	Interactive lecture, brainstorming, dialogue and discussion, self-earning	Quiz
	3/ Practical	: a11 solving problems	Practical: Solving stress issues and emotion	Interactive lecture, brainstorming, dialogue and discussion, self-earning	Quiz
2	2/ Theoretical	a2: getting to know Stress term direct stress and emotion	The concept of forces and stresses	Interactive lecture, brainstorming, dialogue and discussion, self-earning	Quiz
	3 / Practical	a12 : solving problems	Solving stress issues And emotion	Interactive lecture, brainstorming, dialogue and discussion, self-earning	Quiz
3	2/ Theoretical	a3: understanding the law Hook and elastic material How to calculate a coefficient Safety and Longitudinal emotion and accidental and types of cutting	Hooke's law ratio Bousbon , single shear Safety coefficient Single, double cut	Interactive lecture, brainstorming, dialogue and discussion, self-earning	Quiz
	3/ Practical	a13: solving problems	Solving stress issues and emotion	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
4	2 / Theoretical	a4: Identify the tests that are conducted On materials and minerals used in design	technical examinations must be carried out in the design Machinery parts	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	a14: examinations that run on materials and metals before use	Conducting examinations Laboratory (shock and hardness)	Interactive lecture, brainstorming, dialogue and discussion, self-earning	Quiz discussion
5	2/ Theoretical	c1: conduct an experiment stretching on a specific metal and performing a shock test and the hardness	Tensile experiment, Compound stresses in designs	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion

	3 / Practical	a15: Conduct an experiment	Conducting shock, shock and hardness experiments practically	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
6	2 / Theoretical	a5: knowing how Draw shear forces and moments Bending for concentrated loads	Application of shear force and bending moment diagrams for concentrated loads	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	b3: solving problems	solving Power problems Shear and bending Moments for Concentrated loads	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
7	2 / Theoretical	a6: knowing how Draw shear Forces and moments Bending for distributed loads	applying schemes Shear forces and bending moments for distributed loads	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	b4: solving problems	solving Load problems spreader	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
8	2 / Theoretical	c2: knowing how Draw shear Forces and the bending moment when exposed The machine or part for me	applying schemes Shear forces and bending moments Using li or torque	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	b5: solving problems	Solving power problems Shear and Bending moments	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
9	2 / Theoretical	c3: knowing how Draw shear forces and moments Bending for inclined loads	Application of shear force and bending moment diagrams For inclined loads	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3Practical	a16: solve examples	Practical: solving Shear force problems Bending moments for inclined loads	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion

10	2 / Theoretical	a7: knowledge of laments Simple bending theory Explain the concept of curvature	bending theory Simple and its applications	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	a17: finding determination The second is for space for each Other shapes	How to find the second moment for the area of some shapes T and I	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
11	2 / Theoretical	a8: acquisition Knowing how to find the second moment for space using the axial method Parallel or Regular and specific neutral line	The second moment of space and the neutral axis	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	b6: solve examples	Solve finding problems The second moment of area and line neutral	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
12	2 / Theoretical	a9: knowledge Shapes of thresholds Most used Common in designs	geometric thresholds Most used in designs	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	a18: more clarification Thresholds used in Designs T and I	solving theoretical problems Simple bending	Interactive lecture, brainstorming	Quiz discussion
13	2 / Theoretical	a10: getting to know Elements of torsion theory The concept of theory in preparation Designs	torsion theory Simple and its applications	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	a19: solve Examples rotating parts	solving theoretical problems Simple contortions	Interactive lecture, brainstorming, dialogue	Quiz discussion
14	2 / Theoretical	b1: how to find Moments and twist angles for solid and hollow columns	rotating columns Solid and hollow Used in design	dialogue and discussion, self-learning	Quiz discussion
	3 / Practical	b7: solve examples	solving theoretical problems minor sprains	Discussion , self-learning	Quiz discussion
15	2 / Theoretical	b2: getting to know twist moment diagrams on rotating axes	applying schemes Twist moments on the axis's rotary	Discussion , self-learning	Quiz discussion
	3 / Practical	a20: solving problems	solving theoretical problems Minor sprains	discussion, self-learning	Quiz discussion

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

No.	Evaluation method	Marks	% Grads	Evaluation week
1	Lab. Exam	15	%15	Weeks 3, 5, and 7
2	Quizzes	5	%5	All 1-10 weeks
3	Term Exam	20	%20	Week 10
4	Final Exam(experimental)	20	%20	Week 13
5	Final Exam (Theory)	40	%40	Week 14
	sum	**100**	%100	

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The book Mechanics of Materials, Part One, translated by Professor Dr. Sabah Muhammad Jameel Ali
Main references (sources)	Journal of Mesopotamian Agriculture / College of Agriculture and Forestry / University of Mosul / Iraq
Recommended books and references	
Electronic References, Websites	https://www.fvtc.edu/program/agriculture-horticulture-natural-resources/agriculture/10-070-1/agricultural-equipment-technology

مدرس المادة العملي

م. شامل محمد صالح حسن

مدرس المادة النظري

م. د. محمد حسين احمد المولى

رئيس اللجنة العلمية

أ. د. عادل احمد عبد الله

جامعة الموصل
كلية الزراعة والغابات

رئيس قسم المكائن وآلات الزراعية

أ. م. نوفل عيسى محيميد

Course Description Form

1. Course Name:

Design and Analysis of Agricultural Experimen

2. Course Code:

DAAE302

3. Semester / Year:

2024 – 2025

4. Description Preparation Date:

1 / 2 / 2025

5. Available Attendance Forms:

Combined (Attendance + distance education)

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

75 hours / 3.5 units

7. Course administrator's name (mention all, if more than one name)

Name: Khalid Mohammed Dawod / Ahmed Majeed Abdulaah
Email: khalid.dawod@uomosul.edu.iq / ahmed3079@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Enable the student to understand, comprehend and identify the types of designs used in agricultural experiments. • Selection of results after analysis to reach superior coefficients. • Identify the types of tests that are performed before and after the experiment

9. Teaching and Learning Strategies

Strategy	- Interactive lectures. - Dialogue and discussion. - Brainstorming. - Reports and homework. - Scientific visits.

10. Course Structure

Week	Hours	Code	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**Theoretical (2)**	A1	symbols – mediation measures – dispersion measures – hypothesis testing	General statistical review	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	B5	Statistical Codes - Solving Questions About Mediation and Dispersion	General statistical review	Interactive lecture and brainstorming, dialogue, and discussion	Quiz

			Measures			
2	**Theoretical (2)**	B1	Types of experiments - Basic rules for designing experiments - Experimental error and confiscation - How to choose an experimental design for any experiment - Methods to be followed in scientific experiments - One-factor experiments with random experimental designs	definitions Full random design, complete random sectors, and Latin square	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	A3	Types of experiments - definition of experimental error and its sources - how to choose the right design	Types of designs used in agricultural experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
3	**Theoretical (2)**	C1	Design definition - advantages and disadvantages - planning for experimentation and randomly distributing transactions	Complete Randomized Design (CRD)	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	B6	Advantages and disadvantages of CRD design- drawing a design diagram-solving questions about the design	Complete Randomized Design (CRD)	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
4	**Theoretical (2)**	C2	How to collect and analyze data statistically – estimating the components of variance	Equation of the mathematical model and estimation of its components	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	C6	Mathematical Model Equation - How Field Data Is Collected - How Variance Components Are Estimated	Variance Components	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Homework
5	**Theoretical (2)**	D1	Definition of design - its advantages and disadvantages - planning for the experiment and distributing coefficients randomly - equation of the mathematical model and estimating its components	Randomized Complete Design	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	C7	Advantages and disadvantages of RCDB design - equation of the mathematical model - solving direct and indirect questions about the design	Randomized Complete Design	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Homework
6	**Theoretical (2)**	D2	Estimating Variation Components – Estimating Missing Observation Values – Estimating the relative efficiency of the design compared to the complete random design	of contrast components – missing observations – Relative efficiency of design	Interactive lecture and brainstorming, dialogue, and discussion	1st Exam
	Practical (3)	B7	Solve questions about contrast components-Solve questions about missing viewing-Solve questions about estimating the relative efficiency of sector design compared to random design	Variation Components – Estimating Missing Observation Values – Estimating the Relative Efficiency of Design	Interactive lecture and brainstorming, dialogue, and discussion	1st Exam
7	**Theoretical (2)**	B2	of design - its advantages and disadvantages - Planning for the experiment and distributing coefficients randomly - Equation of the mathematical model and estimating its components - How to collect data and analyze it statistically	Latin Square Design	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Homework

	Practical (3)	B8	Advantages and disadvantages of LSD Design - How to draw an experiment diagram using Latin square design	LSD Latin Square Design	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
8	**Theoretical (2)**	A2	Identify the different designs used in field experiments	Visit the Field Crops Department Research Station to learn about the designs used in the experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Homework
	Practical (3)	C8	Practical Application at the Field Crops Department Experiment Station	Visit the field crops research station to learn about the designs used in agricultural experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
9	**Theoretical (2)**	C3	Types and conditions of use of any of them - Test by the Dont method - Test in a way with less significant difference - Test by Duncan method Multi-range	of comparisons between averages of transactions	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	D5	Solving examples of using the Donut method - solving examples of using the LSD method - solving questions about using the Duncan method	of testing and comparing averages	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Homework
10	**Theoretical (2)**	D3	How to Calculate the Relative Efficiency of LSD Design - Estimating the Lost Viewing Value of LSD Design	efficiency and lost viewing of LSD design	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Report
	Practical (3)	C9	Advantages and disadvantages of factor experiments - drawing a diagram of factor experiments - what are factor coefficients and what is the interaction between factors	first part of factorial experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
11	**Theoretical (2)**	B3	Definition of factorial experiments - their benefits - disadvantages - equation of the mathematical model - diagram of the factor experiment	first part of factorial experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz Report
	Practical (3)	D6	Solving Questions About Factor Experiments Using CRD Design - Solving Questions About Factor Experiments Using RCBD Design - Solving Questions About Factor Experiments Using LSD Design	second part of factorial experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
12	**Theoretical (2)**	C4	the interaction between factors through the analysis of variance table and graph	second part of factorial experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	B9	How to collect data - what is data - data tabulation - analyze data statistically	collection and analysis statistically	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
13	**Theoretical (2)**	B4	Interaction graph - representation of factor coefficients by symbols - usefulness of interference between factors	Interaction in factor experiments	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
	Practical (3)	A4	Writing the anova table for factorail experiments with more than two factors - drawing the interaction between factors graphically	Interaction between factors through Anova table and graph	Interactive lecture and brainstorming, dialogue, and discussion	Quiz
14	**Theoretical (2)**	C5	Definition - benefits - reasons for its use - how to implement experiments with two workers according to split-plot with	Split-plot Experiments	Interactive lecture and brainstorming, dialogue, and discussion	2nd Exam

			the three designs mentioned above			
	Practical (3)	A5	Advantages of experiments with the split-plot system - solving questions about split-plot experiments - reasons for using split-plot	Split-plot Experiments	Interactive lecture and brainstorming, dialogue, and discussion	2nd Exam
15	**Theoretical (2)**	D4	application on taking measurements of traits and entering them in tables	How to take measurements of traits and put them in tables	Interactive lecture and brainstorming, dialogue, and discussion	
	Practical (3)	B10	application on taking measurements and placing them in tables	How to take measurements of traits in the field and put them in tables	Interactive lecture and brainstorming, dialogue, and discussion	

11. Course Evaluation

No.	Evaluation Methods	Evaluation Date (week)	Degrees	Relative weight
1	theatrical Quiz	1 – 14	10	20%
2	Practical Quiz	1 – 14	10	
3	1st Exam	6	20	30%
4	1st Exam	6	10	
5	Reports	11 – 10	10	20%
6	Homework	4 – 5 – 7 – 8 – 9	10	
7	2nd Exam	14	20	30%
8	2nd Exam	14	10	
	Total		100	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book of Design and Analysis of Agricultural Experiments - Khasha Mahmoud Al-Rawi and Abdul Aziz Muhammad Khalaf Allah 2000
Main references (sources)	Book of Statistical Methods in Agricultural Experiments - Khaled Muhammad Dawood and Zaki Abdel Elias 1990
Recommended books and references (scientific journals, reports…)	Lectures in Probability and Statistics: Lectures given at the Winter School in Probability and Statistics held in Santiago de Chile
Electronic References, Websites	https://www.statista.com/

جامعة الموصل
كلية الزراعة والغابات

رئيس القسم
أ.م. نوفل عيسى محميد

رئيس اللجنة العلمية
أ.د. عادل احمد عبدالله

مدرس المادة العملي
م.م. أحمد مجيد عبد الله

مدرس المادة النظري
أ.د. خالد محمد داود

Course Description Form

1. Course Name:
Sowing and fertilizing equipment
2. Course Code:
SOFE378
3. Semester / Year:
First semester (autumn)/2024−2025
4. Description Preparation Date:
1/2/2025
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 & Laith Mahmoud Yahya Email: hu_hamood@uomosul.edu.iq
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 sowing and fertilizing equipment in order to develop education, training and research programmed. - 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 sowing and fertilizing equipment design 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 symptoms in sowing and fertilization equipment and the possibility of treating them within a specific period to reveal the student's skill ability. Assigning the student to calibrate and adjust sowing and fertilization equipment and ensure that its field performance requirements are met.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	a1: Explain the basics and principles of seed characteristics and seed technology	Physical and technical characteristics of seeds	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b1: Acquires the ability to explain the basics and principles of seed characteristics and seed technology	Basics and principles of seed traits and seed technology	Attendance, distance education, or video lectures	Discussions, quizzes and reports

2	2 Theoretical	a2: Understands new sowing methods	New sowing methods	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b2: Acquire skill in using new sowing methods	sowing methods	Attendance, distance education, or video lectures	Discussions, quizzes and reports
3	2 Theoretical	a3: Learn about the classification of new sowing equipment and methods	Principles adopted in classifying sowing equipment	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b3: Acquires skill in classifying new sowing equipment and methods.	Classification of new sowing equipment and methods	Attendance, distance education, or video lectures	Discussions, quizzes and reports
4	2 Theoretical	a4: understands the techniques of seed feeding mechanisms.	Seed feeding techniques	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b4: Acquires the skill in classifying seed feeding mechanisms	Classification of seed feeding mechanisms	Attendance, distance education, or video lectures	Discussions, quizzes and reports
5	2 Theoretical	a5: understands the use of sowing and planting equipment and methods	Techniques of feeding mechanisms for cultivation and sorting –farrows and tubes transporting seeds	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b5: Acquires skill in using feeding mechanisms for cultivation and sorting - farrows and tubes transporting seeds	Feeding mechanisms for cultivation and sorting – farrows and tubes transporting seeds	Attendance, distance education, or video lectures	Discussions, quizzes and reports
6	2 Theoretical	a6: understands sowing classification and modern methods of agriculture	Types of seedlings based on prose and underlining – Types of plantings on lines	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b6: Acquires skill in sowing classification and modern methods of agriculture	sowing classification and modern methods of agriculture	Attendance, distance education, or video lectures	Discussions, quizzes and reports
7	2 Theoretical	a7: understands the parts and components of Sowing equipment	Sowing equipment	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b7: Acquires the skill to describe the parts and components of Sowing equipment	Parts and components of Sowing equipment	Attendance, distance education, or video lectures	Discussions, quizzes and reports
8	2 Theoretical	a8: understands designing, manufacturing and managing seedlings in a way that develops the agricultural sector	Seedling techniques + Monthly exam 1	Questions that include leading topics	Class test
	3 Practical	b8: Acquires the skill in classifying, manufacturing and managing seedling equipment	Classification, manufacturing and management of seedling equipment + a monthly practical exam	Questions that include leading topics	practical test
9	2 Theoretical	a9: Identify the contents of sowing and fertilization	A field visit to sowing and fertilization equipment	A lecture by technicians in	Questions and reports

		equipment manufacturing workshops and specialized exhibitions	manufacturing workshops and specialized exhibitions	the repair shop	about the visit
	3 Practical	b9: The student is shown the contents of sowing and fertilization equipment manufacturing workshops and specialized exhibitions	Safety requirements in the circulation of contents of sowing and fertilization equipment manufacturing workshops and specialized exhibitions	A lecture by technicians in the repair shop	Questions and reports about the visit
10	2 Theoretical	a10: understands the parts and components of potato planters and rice seedlings	Parts and components of potato planters and rice seedling techniques	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b10: Acquires the skill in describing the parts and components of potato planters and rice seedlings	Parts and components of potato planters and rice seedlings	Attendance, distance education, or video lectures	Discussions, quizzes and reports
11	2 Theoretical	a11: Explains the basics and principles of the characteristics of organic fertilizer	Physical, chemical and technical characteristics of organic fertilizer	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b11: Acquires the ability to explain the characteristics of organic fertilizer	Organic fertilizer	Attendance, distance education, or video lectures	Discussions, quizzes and reports
12	2 Theoretical	a12: understands the types of fertilization equipment for organic fertilizer	Types of fertilization equipment for organic fertilizer	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b12: Acquires the skill in classifying new organic fertilization equipment and methods	Organic fertilization equipment and methods	Attendance, distance education, or video lectures	Discussions, quizzes and reports
13	2 Theoretical	a13: Clarifies the basics and principles of chemical fertilizer characteristics	Physical and technical characteristics of chemical fertilizer	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b13: Acquires the ability to explain the characteristics of chemical fertilizer	Chemical fertilizer	Attendance, distance education, or video lectures	Discussions, quizzes and reports
14	2 Theoretical	a14: understands the design and classification of new chemical fertilization equipment and methods	The engineering principles adopted in classifying fertilization equipment for chemical fertilizers	Attendance, distance education, or video lectures	Discussions, quizzes and reports
	3 Practical	b14: Acquires the skill in classifying new chemical fertilization equipment and methods	Organic fertilization equipment and methods	Attendance, distance education, or video lectures	Discussions, quizzes and reports
15	2 Theoretical	a15: understands the design of chemical fertilizer spreaders and soil application equipment	The technological process in spreading chemical fertilizers and equipment for applying fertilizer into the soil + monthly exam 2	Questions that include leading topics	Class test
	3 Practical	b15: Acquire skill in designing chemical fertilizer spreaders and equipment for applying fertilizer to the soil	Chemical fertilizer spreaders	Questions that include leading topics	practical test

11. 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:8	4 theoretical + 2 practical	%6
3	Monthly test 2	Week:15	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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Seeding and planting equipment. Dr. Nateq Sabri.
Main references (sources)	Seeding and planting equipment. Dr. Nateq Sabri.
Recommended books and references (scientific journals, reports...)	Agricultural Engineering Manual. Dr. Abdul Muti Al-Khafaf
Electronic References, Websites	https://www.youtube.com + Agricultural Engineering website

مدرس المادة النظري

م. حسين عبد كلوت

جامعة الموصل
الزراعة والغابات
قسم
المكائن والالات الزراعية

رئيس قسم المكائن والآلات الزراعية

أ. م. نوفل عيسى محيميد

مدرس المادة العملي

م. ليث محمود يحيى

رئيس اللجنة العلمية

أ. د. عادل احمد عبدالله

Course Description Form

1. Course Name:
Soil Preparation Equipment
2. Course Code:
SOPE377
3. Semester / Year:
first semester 2024-2025
4. Description Preparation Date:
1/2/2025
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 \ 3.5 Units
7. Course administrator's name (mention all, if more than one name)
Name:Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq **Shalih Sabry Ali**
8. Course Objectives
1- Explaining the basics and principles of engineering sciences and their applications in the field of soil preparation equipment **2- Gaining knowledge in improving soil treatments and preparing it with machines in a way that suits agricultural reality and development** **3- The ability to develop modern soil preparation systems in line with the general trend in production and the requirements of human resources capable of dealing with those systems**
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	a1 knows the importance of soil and its types and knows the types of tillage	Importance, types of soils, and types of tillage	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 tests the technological properties of the soil a2 classifies types of soil preparation equipment	Technological characteristics of the soil and their impact on tillage operations and types of tillage Classification of tillage equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
2	2 theoretical	a1 knows what the mold board plow is and its parts, and remembers its features a5 distinguishes its types	Mold board plow Types_features_ parts	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 tries and tests the mold board plow in the field c2write a report on the mold board plow	Applications, regulations,and field experiments on the mold board plow	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
3	2 theoretical	a1 knows what a disc plow is and its parts, and remembers its features a5 distinguishes its types	disc plow Types - features - parts	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 trials and tests a disc plow in the field c2write a report on the disc plow	Applications, regulations, and field experiments on the disc plow	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
4	2 theoretical	a1 knows what a vertical disc plow is and its parts, and remembers its features a5 distinguishes its types	Vertical disc plow - types - features - parts	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 tries and tests a vertical disc plow in the	Applications, regulations,and	Interactive lecture,	Short daily test1 Semester test1

		field **c2write a report on the vertical disc plow**	**field experiments on the Vertical disc plow**	**brainstorming, dialogue and discussion, field training, and self-learning**	**Final test**
5	**2 theoretical**	**a1 knows what a chisel plow is and its parts, and remembers its features** **a5 distinguishes its types**	**Chisel plow - types - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests the chisel plow in the field** **c2writes a report on the chisel plow**	**Applications, regulations,and field experiments on the** **The chisel plow**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
6	**2 theoretical**	**a1 knows what a rotary plow is and its parts, and remembers its features** **a5 distinguishes its types**	**Rotary plow - types - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests the rotary plow in the field** **c2write a report on the rotary plow**	**Applications, regulations,and field experiments on the Rotational plow**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
7	**2 theoretical**	**a1 knows what subsoil plow is and its parts, and remembers its features** **a5 distinguishes its types**	**Subsoil plow (mulching and maintenance plow) - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests the subsoil plow in the field** **c2write a report on the subsoil plow**	**Applications, regulations,and field experiments on the subsoil plow**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
8	**2 theoretical**	**a1 knows what a plow or undercutting hoe is and its parts, and remembers its features** **a5 distinguishes its types**	**Undercut plow or hoe - types - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests the plow or the sub-cutting hoe in the field** **c2 writes a report on the**	**Applications, regulations,and field experiments on subsoiler shear**	**Interactive lecture, brainstorming, dialogue and**	**Short daily test1** **Semester test1** **Final test**

		plow or the undercut hoe	**joints**	**discussion, field training, and self-learning**	
9	**2 theoretical**	**a1 knows the types of combs and their parts and remembers their features harrows** **a5 distinguishes its types**	**Disc, crawler, and toothed combs - types - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests types of harrows in the field** **c2write a report on the types of combs**	**Applications, regulations, and field experiments on combs of all kinds**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
10	**2 theoretical**	**a1 knows what rollers, leveling machines and their parts are, and remembers their features** **a5 distinguishes its types**	**Rollers and graders -** **Types - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests graders and graders in the field** **c2 writes a report on rollers and graders**	**Applications, regulations, and field experiments on rollers and graders**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
11	**2 theoretical**	**a1 knows what planning machines and their parts are and remembers their features** **a5 distinguishes its types**	**Planning machines and compound machines - types - features - parts**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 tries and tests plotting machines in the field** **c2writes a report on plotting machines**	**Applications and organization of field experiments on planning machines**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
12	**2 theoretical**	**a1 knows what the mechanical assembly of soil preparation machines and its parts is and remembers its advantages** **a5 distinguishes its types**	**Mechanical assembly of preparation machines** **Soil and its systems**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c3 experiments and tests**	**Applications,**	**Interactive**	**Short daily test1**

		the mechanical assembly of soil preparation machines in the field **c2 write a report on the mechanical assembly of soil preparation machines**	**regulations, and field experiments on mechanical assembly machines**	**lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Semester test1** **Final test**
13	**2 theoretical**	**c1 calculates field productivity and field efficiency of soil preparation equipment**	**Calculating the process productivity and field efficiency of initializing machines** **the soil**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**a3 solves mathematical problems about field productivity and field efficiency**	**Solve mathematical problems on how to calculate field productivity and field efficiency**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
14	**2 theoretical**	**c1 calculates the capacity and sliding requirements of soil preparation equipment**	**Calculating the power, sliding, and (floating and soil compaction) requirements for soil preparation machines**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**a 3 solves calculation problems about capacity requirements and sliding of soil preparation equipment**	**Solve mathematical problems on how to calculate power and slip requirements with field experiments**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**
15	**2 theoretical**	**a1 knows the importance of maintaining and maintaining soil preparation equipment**	**The importance of maintenance and maintenance - storing soil preparation machines**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1** **Semester test1** **Final test**
	3 Practical	**c4 inspects machinery in the field** **c3 is trying to perform maintenance operations and perpetuate**	**Educational field applications for how to maintain, sustain, and store soil preparation machines**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1** **Semester test1** **Final test**

10. 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)	معدات تهيئة التربة 1999 د. عزيز رمو البنا
Main references (sources)	
Recommended books and references (scientific journals, reports...)	الآلات الزراعية 1995 د.سهيل بربارة المرجع في الميكانيك الزراعي1987 د.عادل الصفار
Electronic References, Websites	https://www.youtube.com

مدرس المادة العملي
م.م.صالح صبري علي

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

مدرس المادة النظري
م.أحمد محمدأمين سعيد

رئيس اللجنة العلمية
أ.د. عادل أحمد عبدالله

Course Description Form

1. Course Name:
Irrigation and Drainage Equipment
2. Course Code:
IRDE382
3. Semester / Year:
Second semester 2024-2025
4. Description Preparation Date:
1/2/2025
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 / 3.5 Units
7. Course administrator's name (mention all, if more than one name)
Name:Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq **Mahmood Hassan Rafeek**
8. Course Objectives
1- Studying the science of irrigation machines, equipment and devices and what are the purposes for which the irrigation process is carried out. **2- Study the types of pumps used in the field of irrigation, their parts, installation, how to install and operate them, and methods of sustaining, maintaining and repairing them.** **3- Identify the types of sprinkler and drip irrigation systems, the disadvantages and advantages of each system, and the parts of the irrigation network for each type.** **4- Identify the types of sprinklers and drippers used in sprinkler and drip irrigation and how they work, install them, operate and maintain them.** **5- Choosing the appropriate irrigation method for the type of soil and the type of crop grown by choosing the appropriate equipment and devices for that.** **6 - Use water in the irrigation process correctly and economically through the appropriate equipment.** **7- Understanding the scientific and engineering foundations of irrigation systems with all their mechanical parts and how to design and modify them to suit the nature of the field, its topography, the nature of the irrigation water source, the type of cultivated plants, and the type of soil.** **8- Study the auxiliary equipment for puncture operations to suit the type of puncturing system in the field**
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 The student learns about the types and types of irrigation pumps A2Understands the hydraulic foundations of pumps	Irrigation pumps (types and basics) and hydraulic foundations for pumps used in irrigation systems	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	C2 The student explains the methods of attaching and disassembling pumps A2 Explains the role and importance of each part of the pump	Explaining the mechanical parts of irrigation pumps and how to connect and disassemble them	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
2	2 theoretical	A2The student learns about centrifugal pumps A2 and classifies its types C1 and enumerates its features and parts	Centrifugal pumps, their types, features and parts	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies the processes of installing and operating centrifugal pumps in the fields C4 The type of motor required for each pump is determined to suit the pumping requirements	Places for installing and operating centrifugal pumps in the fields and connecting them in series or parallel to suit the types of engines used.	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
3	2 theoretical	A1 The student understands and calculates the pumping and discharge height,necessary capacity and efficiency of pumps B3 implements installation and running processes Pumps	Installing and operating pumps, calculating the pumping and discharge height, the necessary capacity, and the efficiency of the pumps	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	A3 Solves mathematical problems about pumping and discharge height, required capacity, pump efficiency, and choosing the appropriate pump.	Mathematical problems about pumping and discharge height, necessary capacity, pump efficiency, and choosing the appropriate pump	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
4	2 theoretical	A2The student learns about turbine and submersible pumps A2 and classifies its types C1 and enumerates its	Turbo and submersible pumps, their types,advantages, disadvantages, and parts	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1

		features and parts			Final test
	3 Practical	B3 The student applies the installation and operation of turbine and submersible pumps in the fields C4 The type of motor required for each pump is determined to suit the pumping requirements	Installing and operating pumps Turbine and submersible turbines, their maintenance and maintenance	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
5	2 theoretical	A2 The student learns about mixed flow pumps and axial pumps A2 and classifies its types C1 and enumerates its features and parts	Mixed flow pumps and axial pumps (their advantages, disadvantages, and parts)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies the installation and operation of mixed flow pumps and axial pumps in the fields C4 specifies the type of engine required for each Pump to suit pumping requirements	Installing and operating flow pumps Mixed and axial pumps and connecting them in series and parallel to suit the types of engines used	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
6	2 theoretical	A1 The student learns about sprinkler irrigation A1 and understands its uses C1 enumerates its advantages and disadvantages A5 and distinguishes its types	Sprinkler irrigation (advantages and disadvantages) Areas of its use and types of sprinkler irrigation systems	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	C4 The student connects the engineering and field foundations with the type of sprinkler system that is compatible with the topography of the field, the type of soil, the types of cultivated plants, and the climate of the region.	Field engineering foundations for selection The type of sprinkler irrigation system that suits the topography of the field, the type of soil, the types of plants grown, and the climate of the area	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
7	2 theoretical	A2 The student learns about the fixed and semi-fixed sprinkler irrigation system A2 and classifies its types C1 and enumerates its features and parts	Fixed and semi-fixed sprinkler irrigation systems, their advantages and disadvantages, and the component parts of irrigation networks	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies the processes of installing and operating a fixed and semi-fixed sprinkler irrigation system in the fields A3 solves mathematical problems about drainage, pressure, and water distribution uniformity coefficient calculations	Field applications for the design and installation of fixed and semi-fixed sprinkler irrigation networks, selection of sprinklers, determining the distances between them, drainage and pressure calculations, and water distribution uniformity	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

			coefficient.		
8	2 theoretical	A2 The student learns about the artillery sprinkler irrigation system A2 and its types are classified C1 and enumerates its features and parts	Irrigation by artillery sprinkler, its types and parts Its features and methods of installation and operation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies the operations of installing and operating an artillery irrigation system in the fields A3 solves mathematical problems about drainage, pressure, and water distribution uniformity coefficient calculations	B3 The student applies the processes of installing and operating an artillery irrigation system in the fields A3 solves mathematical problems related to calculations of drainage uniformity coefficient, pressure and water distribution	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
9	2 theoretical	A2 The student learns about the winged sprinkler irrigation system A2 and its types are classified C1 and enumerates its features and parts	Winged sprinkler irrigation, its types, parts, features, and methods of installing and operating it	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies the processes of installing and operating a winged sprinkler irrigation system in the fields A3 solves mathematical problems about drainage, pressure, and water distribution uniformity coefficient calculations	Field applications for irrigation design and installation Winged spraying, drainage calculations, pressure, and water distribution uniformity coefficient	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
10	2 theoretical	A2 The student learns about the linear moving sprinkler irrigation system A2 and its types are classified C1 and enumerates its features and parts	Linear moving sprinkler irrigation , its types, parts, features, and methods of installation and operation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies the processes of installing and operating a linear moving sprinkler irrigation system (driver) in the fields A3 solves mathematical problems about drainage, pressure, and water distribution uniformity coefficient calculations	Field applications for the design and installation of linearly moving sprinkler irrigation, drainage and pressure calculations, and water distribution uniformity coefficient.	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
11	2 theoretical	A2 The student learns about the circular (pivot) sprinkler	Circularly moving sprinkler irrigation (pivotal), its	Interactive lecture, brainstorming,	Short daily

		irrigation system. A2 and its types are classified C1 and enumerates its features and parts	**types, parts, features and methods Install it and run it**	**dialogue and discussion, self-learning**	**test1 Semester test1 Final test**
	3 Practical	**B3 The student applies the processes of installing and operating a circular (pivot) sprinkler irrigation system in the fields A3 solves mathematical problems about drainage, pressure, and water distribution uniformity coefficient calculations**	**Field applications for the design and installation of circularly moving (pivotal) sprinkler irrigation, drainage and pressure calculations, and water distribution uniformity coefficient.**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1 Semester test1 Final test**
12	**2 theoretical**	**A1 The student learns about drip irrigation A1 and understands its uses C1 enumerates its advantages and disadvantages A5 and distinguishes its types**	**Drip irrigation system, its importance, advantages, disadvantages, areas of use, types, and components of each type**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1 Semester test1 Final test**
	3 Practical	**C4 The student connects the engineering and field hydraulic foundations with the type of drip system that is compatible with the topography of the field, the type of soil, the types of cultivated plants, and the climate of the region.**	**Drip irrigation networks, their system design, drainage calculations, pressures and interspaces**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1 Semester test1 Final test**
13	**2 theoretical**	**C4 The student connects the engineering and field hydraulic foundations with the type of drip irrigation system A2 Understands the mathematical equations for each type of pixel**	**Hydraulic engineering foundations for the different types of drippers and the mathematical equations specific to each type**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1 Semester test1 Final test**
	3 Practical	**A3 The student solves exercises and problems about th hydraulic foundations of different types of drippers**	**Solve exercises and problems about the hydraulic foundations of different types of drippers**	**Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning**	**Short daily test1 Semester test1 Final test**
14	**2 theoretical**	**A1 The student learns about subsurface irrigation A1 and understands its uses C1 enumerates its advantages and disadvantages A5 and distinguishes its types**	**Subsurface irrigation, its importance, advantages, disadvantages, areas of use, types, and components of each type**	**Interactive lecture, brainstorming, dialogue and discussion, self-learning**	**Short daily test1 Semester test1 Final test**

	3 Practical	B3 The student applies the processes of installing and operating a subsurface irrigation system in the fields A3 solves mathematical problems about drainage, pressure, and interspace distances	Subsurface irrigation networks, their system design, drainage calculations, pressures and inter-space distances	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
15	2 theoretical	A2 The student learns about all types of equipment used in puncture networks B3 The student applies installation and operation operations for aspiration network equipment	Equipment and machines used in puncture networks and how to connect and operate them	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	B3 The student applies maintenance, repair, and maintenance processes for various irrigation equipment	Maintenance and repair of irrigation and drainage equipment and machines	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

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- المضخات الزراعية . المؤسسة العامة للتعليم الفني والتدريب المهني 2005 2- الري بالرش الأجهزة والتطبيقات – ملفين كاي 2000 3- تقانات الري الحديثة . د.عصام خضير الحديثي وآخرون 2010 4-هندسة المضخات , محمود ربيع الملط 2000 5- هندسة الري , محسن حسين نوارة و حسن محمد حسيني
Recommended books and references (scientific journals, reports...)	1- الري اساسياته وتطبيقاته – د. نبيل ابراهيم – عصام خضير 1990 2- الري الزراعي – د. بدر جاسم علاوي – محمد حسن عزوز 198 3- هندسة مياه الري . د.فاضل محمد ظاهر 2021 4- معدات الري والبزل . د.عبدالرزاق عبداللطيف و د.شذى ماجد نفاوة 2017 5- Irrigation Eystems Engineering , Dr. A. Y. HACHEM & H. Ismaail ,st Addition, Dar Alhikma Publisher, Mosul Univ. Press, 1992
Electronic References, Websites	https://www.youtube.com

مدرس المادة العملي
م.محمود حسن رفيق

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والالات الزراعية

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

مدرس المادة النظري
م.أحمد محمدأمين سعيد

رئيس اللجنة العلمية
أ.د. عادل أحمد عبدالله

Course Description Form

1. Course Name:

Mechanics of tractors performance

2. Course Code:

METP380

3. Semester / Year:

Second semester (spring)/2024−2025

4. Description Preparation Date:

1/2/2025

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: Mothana Abed Al-malik Noori
Husain Abed Hammood & Saleh Sabry Ali
Email: moth1973@uomosul.edu.iq

8. Course Objectives

Course Objectives	− Graduating agricultural engineers and researchers to serve the agricultural sector. − Scientific cooperation with the Directorates of Agriculture and other bodies with the aim of improving agricultural production in terms of quantity and quality. − Investing modern technology in the field of agricultural tractor design in order to develop education, training and research programs. − Qualifying the student to work according to modern production systems that rely on computers and information technology in their work. − Preparing an advanced technical cadre in the field of agricultural tractor design 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 solve mathematical problems within a specific period to reveal the student's skill ability. - Assigning the student to solve mathematical problems at home with different degrees of difficulty 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: 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	Reports, Quizzes, Discussions
	3	c1: Solve mathematical	Applications and	Interactive lecture,	Reports,

	Practical	examples of the forces acting on the tractor while standing and moving	mathematical problems on the forces affecting the tractor at rest and in motion.	dialogue and discussion, field training and practical	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	Reports, Quizzes, Discussions
	3 Practical	c2: Solve mathematical examples of soil strength - ultimate traction force.	Applications and mathematical problems on soil strength – maximum traction force.	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
3	2 Theoretical	a3: Explains and clarifies through lectures	The relationship between real thrust force and maximum thrust force.	attendance lectures using display devices: data shows, smart boards	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 and discussion, field training and practical	Reports, Quizzes, Discussions
4	2 Theoretical	a4: Explains and clarifies through lectures	The relationship between sliding and soil displacement.	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
	3 Practical	c4: 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 and discussion, field training and practical	Reports, Quizzes, Discussions
5	2 Theoretical	a5: Explains and clarifies through lectures	Coefficients (traction – thrust - rolling resistance) , efficiencies (traction - transport).	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	c5: Solve mathematical examples of coefficients (traction - thrust - rolling resistance), efficiencies (traction - transport).	Solve applied mathematical problems about the traction efficiency, transport, and coefficient.	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
6	2 Theoretical	a6: Explains and clarifies through lectures	Rolling resistance resulting from soil compaction and tire flattening	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	c6: Solve mathematical examples of rolling resistance	Solving applied mathematical problems about the rolling resistance resulting from soil compaction and tire flattening.	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
7	2 Theoretical	a7: 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	Reports, Quizzes, Discussions

	3 Practical	c7: 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 and discussion, field training and practical	Reports, Quizzes, Discussions
8	2 Theoretical	a8: 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	Reports, Quizzes, Discussions
	3 Practical	b1: Field tests methods of attaching agricultural mach and the forces affecting on them	Field practice on attaching agricultural machines and the forces affecting on them	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
9	2 Theoretical	a9: Identify the devices and equipment used in mechanical inspection and testing of tractor	A field visit to workshops and laboratories specialize in the inspection and safety of tractor	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	b2: The student is shown the 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 and discussion, field training and practical	Reports, Quizzes, Discussions
10	2 Theoretical	a10: Explains and clarifies through lectures	Stability of tractor (Longitudinal stability and lateral stability)	A lecture by technicians	Reports about the visit
	3 Practical	c8: Solve mathematical examples of the stability of a tactor	Solve mathematical problems about stability and the moments that act on turning the tractor	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
11	2 Theoretical	a11: Explains and clarifies through lectures	Transmission systems (The mechanics of the clutch system).	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	b3: Field tests how the three points hatches system works	Field exercise on how the three points hatches system works	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
12	2 Theoretical	a12: Explains and clarifies through lectures	Types of gearboxes and methods of gearing.	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	c9: Solve mathematical examples about the speed of a tractor from the revolutions per minute	Solving mathematical problems about the speed of a tractor based on revolutions per minutes and the number of teeth of the transmission gears	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
13	2 Theoretical	a13: Explains and clarifies through lectures	reports, quizzes, discussions	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	c10: Apply mathematical examples from the previous topics	reports, quizzes, discussions	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
14	2 Theoretical	a14: Explains and clarifies through lectures	Mechanism of operation of the differential system	attendance lectures using display	Reports, Quizzes,

			- types of final reduction systems+ Hydraulic system.	devices: data shows, smart boards	Discussions
	3 Practical	b4: The student experiences the process of driving, and pulling agricultural implement in the field	Practical and field practice for driving, and pulling agricultural implement	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions
15	2 Theoretical	a15: Explains and clarifies through lectures	Components of the braking system, types of braking systems, types of brakes	attendance lectures using display devices: data shows, smart boards	Reports, Quizzes, Discussions
	3 Practical	b5: Field testing of the performance of the tractor's brake wheels	Practical application of the process of braking tractor wheels and measuring the turning radius with and without braking	Interactive lecture, dialogue and discussion, field training and practical	Reports, Quizzes, Discussions

11. 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

12. 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 Eddin 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 النظري

أ.م. مثنى عبدالمالك نوري

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والآلات الزراعية

رئيس قسم المكائن والآلات الزراعية

أ.م. نوفل عيسى محيميد

مدرس المادة العملي

م. حسين عبد حمود

م. م. صالح صبري علي

رئيس اللجنة العلمية

أ.د. عادل احمد عبدالله

Course Description Form

1. Course Name:
Fluid Mechanics
2. Course Code:
FLME379
3. Semester / Year:
first semester 2024-2025
4. Description Preparation Date:
1/2/2025
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 / 3.5 Units
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq **Salih Sabrry Ali**
8. Course Objectives
1- Introducing the student to how to use conversion tables (energy, pressure, mass, momentum...) And use it in designs, analyses, and flow sciences **2- Increasing the student's knowledge of how pressure occurs and knowing the types and measuring devices** **3- Study losses in pipes and curves and develop correct designs for drainage in pipes** **4- The student's understanding, complete knowledge, and familiarity with the subject of pumps, their types and parts, how they work and operate, finding their costs and pressures, and the ability necessary for that.**
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	a1 knows the meaning of fluid, fluid properties, fluid mechanics, and standard units used to study fluids	Definition of fluid and its relationship to fluid mechanics and fluid properties	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the properties of fluids	Definition of fluid and its relationship to fluid mechanics and fluid properties	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
2	2 theoretical	a2 learns about the meaning of pressure, pressure units, and atmospheric pressure, as well as the basic equations of fluid balance	Hydrostatics (the science of fluid balance)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about hydrostatics (the science of fluid balance)	Hydrostatics (the science of fluid balance)	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
3	2 theoretical	c1 enumerates the types of pressure gauges and knows how each type works	Pressure measuring devices	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about pressure measuring devices	Pressure measuring devices	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-	Short daily test1 Semester test1 Final test

				learning	
4	2 theoretical	a5 the student distinguishes the laws and equations related to the forces acting on flat and inclined curved surfaces of liquids	Forces acting on surfaces due to static fluid pressure	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 it solves mathematical problems about the forces acting on surfaces in the case of a static fluid	Forces acting on surfaces due to static fluid pressure	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
5	2 theoretical	a2 the student learns about the equilibrium conditions for a body completely or partially immersed in a liquid	Equilibrium of submerged and floating bodies in a liquid (conditions of equilibrium)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the balance of submerged bodies	Equilibrium of submerged and floating bodies in a liquid (conditions of equilibrium)	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
6	2 theoretical	a2the student understands the classifications of flow types for fluids and how to derive the continuity equation for fluid flow	Fluid flow, flow classification, and continuity equation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about types of flow and the continuity equation for flow	Fluid flow, flow classification, and continuity equation	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
7	2 theoretical	a1 the student knows the derivation of bernoulli’s equation and its practical applications	Fluid flow and Bernoulli's equation	Interactive lecture, brainstorming, dialogue and	Short daily test1 Semester test1

				discussion, self-learning	Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the bernoulli equation and its applications	Fluid flow and Bernoulli's equation	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
8	2 theoretical	c2 the student benefits from machines and devices that work on applications of the momentum equation	Principles of momentum	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the momentum equation for steady flow and its applications	Principles of momentum	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
9	2 theoretical	a2 the student learns how to find the reynolds number and how to use the darcy equation	The flow of liquid in pipes, Reynolds' experiment, and Darcy's equation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 solves mathematical problems about the reynolds number and the darcy equation	The flow of liquid in pipes, Reynolds' experiment, and Darcy's equation	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
10	2 theoretical	a4the student explains how to find the marginal roughness coefficient for pipes and the coefficient of friction for types of flow	Fluid flow and study of losses through pipes due to friction	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the coefficient	Fluid flow and study of losses through pipes due to friction	Interactive lecture, brainstorming, dialogue	Short daily test1 Semester

		of friction and marginal roughness		**and discussion, field training, and self-learning**	**test1 Final test**
11	**2 theoretical**	**c1 the student enumerates the laws and equations related to the various losses resulting from flow in pipes**	**Fluid flow and study of losses through pipes**	**Interactive lecture, brainstormin g, dialogue and discussion, self-learning**	**Short daily test1 Semester test1 Final test**
	3 Practical	**c4the student conducts experiments a3 and solves mathematical problems about charge loss as a result of flow in its various states**	**Fluid flow and study of losses through pipes**	**Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning**	**Short daily test1 Semester test1 Final test**
12	**2 theoretical**	**a1 the student knows the laws for equivalent pipe and tank emptying**	**Flow in a pipeline**	**Interactive lecture, brainstormin g, dialogue and discussion, self-learning**	**Short daily test1 Semester test1 Final test**
	3 Practical	**c4the student conducts experiments a3 solves mathematical problems about flow in a pipeline**	**Flow in a pipeline**	**Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning**	**Short daily test1 Semester test1 Final test**
13	**2 theoretical**	**a2the student understands and knows the principles used in classifying pumps in general and centrifugal pumps in particular**	**Types of pumps and centrifugal pumps**	**Interactive lecture, brainstormin g, dialogue and discussion, self-learning**	**Short daily test1 Semester test1 Final test**
	3 Practical	**c4the student conducts experiments a3 and solves mathematical problems about the velocity trigonometry diagram of a centrifugal pump**	**Types of pumps and centrifugal pumps**	**Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning**	**Short daily test1 Semester test1 Final test**
14	**2 theoretical**	**a2 the student understands**	**Performance of centrifugal**	**Interactive**	**Short**

		everything related to the performance and operation of centrifugal pumps	pumps	lecture, brainstorming, dialogue and discussion, self-learning	daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the performance of centrifugal pumps	Performance of centrifugal pumps	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
15	2 theoretical	a2 the student understands and knows the types of positive displacement pumps, their operation and performance	Positive displacement pumps (reciprocating and rotary)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4 the student conducts experiments and solves mathematical problems a3 about positive displacement pumps	Positive displacement pumps (reciprocating and rotary)	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

11.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%

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- ميكانيك الموائع الدكتور ياسين هاشم الطحان و المهندس عبد الصابر ابراهيم بكر/جامعة الموصل 1990
Main references (sources)	ميكانيك الموائع وتطبيقاتها الهندسية , روبرت ل.دوجرتي وجوزيف ب.فرانزيني . دار ماكروهيل للنشر1977
Recommended books and references (scientific journals, reports...)	1- ميكانيكا الموائع والهيدروليكا , رينالد ف.جايلز . دار ماكروهيل للنشر 1977 2-ميكانيك الموائع ترجمة الدكتور نبيل زكي مرقص و الدكتور فوزي HFVHIDL صادق/ 1984

	3-Hydraulics and fluid Mechanics .Dr.P.N.Mody ,M.SETH,17th edition .2009
Electronic References, Websites	https://www.youtube.com

مدرس المادة العملي
م.م.صالح صبري علي

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

مدرس المادة النظري
م.أحمد محمدأمين سعيد

رئيس اللجنة العلمية
أ.د. عادل أحمد عبدالله

Course Description Form

1. Course Name:

Irrigation and drainage

2. Course Code:

IRDR 308

3. Semester / Year:

First semester 2024-2025

4. Description Preparation Date:

1 \ 2 \ 2025

5. Available Attendance Forms:

Combined (Attendance + distance education)

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

2 theoretical + 3 practical / 3.5

7. Course administrator's name (mention all, if more than one name)

Name: mooatasim daood .S.agha & Noor Jamal Hussein
Email: mooatasim@uomosul.edu.iq

8. Course Objectives

- Enable the student to understand what is the science irrigation and what is the irrigation process - Enabling the student to become familiar with classification of irrigation water - Enabling students to appreciate irrigation competenc - Enable the student to schedule irrigation and know water needs of the crop - Enabling the student to know the different irrigat methods - Enable the student to learn about the characteristics sprinkler and drip irrigation	**practical:** **- Enable the student to recognize the mathematical relationships between soil parameters and knowledge of the depth of water in the soil** **- The student will be able to estimate the moisture content of the soil - work on the pressure device and estimate the ready wa** **- He can estimate the tip** **- The student is able to estimate and calculate water consumption.** **- The student estimates the volume of wate and drainage in the canals**

9. Teaching and Learning Strategies

theoretical: - Interactive lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting	practical: - Assigning group work to reveal leadership skills - Assigning tasks and reporting for each experiment

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2 Theoreti 3 practical	Theoretical:a1 What is the science of irrigatio the irrigation process, and what are the sourc of water Practical:a8What are soil components properties that matter irrigation and drainage	theory: Irrigation science Practical: Mathematical relationships of soil components	theory: Audio methods, blackboard practical : Laboratory worl to estimate some properties	Short exams, assignments, discussions
2	2 Theoreti 3 practical	Theoretical: a2The student learns about rain-fed regions and what purposes irrigation achieves Practical: a9examples and applications of equivalent depth	Theoretical: Classification of rai fed regions practical : Estimating the equivalent depth of soil water	Theoretical: The blackboar a style of dialog practical : Laboratory application reporting	Short exams, assignments, discussions
3	2 Theoreti 3 practical	Theoretical: a3The student is famil with the standards adopted in evaluating quality of irrigation water in terms of salinity, sodicity, and toxicity Practical b9Laboratory work estimate soil moist content	Theoretical: Standards adopted i evaluating th quality of irrigation wa practical : Estimating soil moisture conservation	Theoretical: Audio methods: writing on the blackboard practical : Assigning tasks and reporting	Short exams, assignments, discussions
4	2 Theoreti 3 practical	Theoretical: a4The student will b able to estimate irrigation efficiencie (efficiency of transportation, irrigation, storage, ar homogeneity) Practical:b10 The student can work on th pressure device	Theoretical Irrigation efficiencie Practical: press device	Theoretical: The solution method is on th board Practical Laboratory w and writ reports	Short exams, assignments, discussions
5	2 Theoreti 3 practical	Theoretical: b1Applications and solutions of examples irrigation efficiencies a uniformity coefficient Practical: b11The stud is able to estimate	Applications and examples of irrigatio efficiencies Practical: Estimating field capacity and permanent wilting	Theoretical: Examples on th board practical : Make reports	Short exams, assignments, discussions

		calculate ready-m water	point		
6	2 Theoreti 3 practical	Theoretical:a5 The student is able to learn about irrigation scheduling and what water needs are Practical: a10The student can estimate water consumption	Theoretical: Scheduling irrigatio and water needs Practical: water consumption	Theoretical: The blackboard a direct dialogu style practical : Assigning ta and reports	exams,
7	2 Theoreti 3 practical	Theoretical:b2 The student learns the stages of plant growth and the related curve, well as calculating the number of days betwe one irrigation and another Practical: b12The stude can estimate evaporat using an evaporation basin	Theoretical: Plant growth stages irrigation frequency Practical: evaporat pan	Theoretical: Audio methods, writing style on blackboard practical : Assigning ta and reporting	Short exams, assignments, discussions
8	2 Theoreti 3 practical	Theoretical:a6 The student is able to learn about the differe methods of irrigation and the ability to understand the advantages of surface irrigation Practical: b13 student is able estimate water draina	Theoretical: Different ways to a water Practical: Meth of wa measurements	Theoretical: Auditory metho 'whiteboard method Practical: field observations	Short exams, assignments, discussions
9	2 Theoretical:b3 3 practicaldent is familiar with the irrigation method wit irrigation, its characteristics, and estimating the depth o irrigation using the irrigation method Practical: a11 student is able estimate water draina		Theoretical: e irrigation method Practical: Methods of measuring water - measuring facilities	Theoretical: Writing on the blackboard is a practical direct dialogue metho Assigning ta and reporting	Short exams, assignments, discussions
10	2 Theoreti 3 practical	Theoretical:b4 The student is able to learn about the advantages of sprinkle irrigation as well as	Theoretical: Sprinkler irrigatio	Theoretical: Audio methods, blackboard work: field	Short exams, assignments, discussions

		devices Practical: a12The student will be able to estimate rain in the fie or laboratory	Partical : the tip	laboratory wor	
11	2 Theoreti 3 practical	Theoretical:b5 The student is able to estimate the capacity the sprinkler irrigation system, the capacity o one sprinkler Practical: b14Applyin the infiltration basin	Theoretical: Sprinkler irrigation system capaci Practical: infiltration in the basin method	Theoretical: Writing on the blackboard is a practical direct dialogue metho Assigning ta and reporting	Short exams, assignments, discussions
12	2 Theoreti 3 practical	Theoretical:b6 The student is able to identify the characteristics and determinants of drip irrigation, and estima the coefficient of consistency Practical: a13The student is able to appl water consumption equations	Theoretical: Drip irrigation Practical: Water consumption experimental metho	Theoretical: Chalkboard sty practical : Applications ir water consump n	Short exams, assignments, discussions
13	2 Theoreti 3 practical	Theoretical:a7 The student is able to know the types of trocars, vertical trocars, and the characteristics of op trocars Practical: a14Mathematical applications about t infiltration	Theoretical: Types of drain Practical: Estimat the Infiltration rate	Theoretical: Audio methods, blackboard Practical: Problems about calculating infiltration	Short exams, assignments, discussions
14	2 Theoreti 3 practical	Theoretical:b7 The student learns abo covered drain and what is the classification of dra according to the natu of their work Practical:a15 The student is able to iden what drainage	Theoretical: Covered drain Practical: drainage	Theoretical: The blackboard a direct dialogu style ical : gning tasks reporting	exams
15	2 Theoreti 3 practical	Theoreticalb8 By knowing the dista	Theoretical: Calculate the distan	Theoretical: Audio methods	Short exams, assignments,

		between the drain, the student will be able to know the depth of the drainage layer. Practical:a16 T student will be able understand open covered drain system	between the drain Practical: dr systems	style, blackboard practical : Display post for assignme and reports	discussions

11. Course Evaluation

	Evaluation	Time of evalution	Degree	Relative weight
1	Theoretical final report + practical experience reports	Theoretical week 15. Practical week 1-15	7Theoretical + 6Practical	13%
2	Quiz -1-	Week 3	4 Theoretical + 2 practical	6%
3 4	Midterm Exam	Week 9	10 theoretical + 5 practical	15%
5	Final practical test	Practical exams week	20%	20%
6	Final theoretical test	The week of theoretical exams	40%	40%
sum			100%	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book on irrigation and drainage (Prof. Dr. La Khalil Ismail)
Main references (sources)	Irrigation, its basics and applications (Prof. Nabil Ibrahim and Prof. Dr. Issam Khader Hadithi)
Recommended books and references (scientific journals, reports...)	Mesopotamia Journal of Agriculture and Al-Anbar Journal of Agricultural Sciences
Electronic References, Websites	The World Health Organization, and the US Fo and Drug Administration.

مدرس المادة العملي : م.م. نور جمال

مدرس المادة النظري : ا . م معتصم داود سليمان أغا

رئيس القسم: أ.م. نوفل عيسى محمود

رئيس اللجنة العلمية : أ.د. عادل احمد عبد الله

Course Description Form

1. Course Name:
Forage Equipment
2. Course Code:
FOEQ485
3. Semester / Year:
Spring / 2024-2025
4. Description Preparation Date:
1st Fab. 2025
5. Available Attendance Forms:
Attendance +electronic
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours (2 hours theorotucal +2 hours Practical) / 2.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Khalid E. Ahmed Mahmmod H. Rafiq
8. Course Objectives
1- Enabling the student to understand and comprehend what is related to the mechanization of animal production And it 's impact on increasing animal production 2- Enabling the student to know the types of this equipment and their uses in order to provide an optimum animal breeding environment
9. Teaching and Learning Strategies

Strategy	Theoretical: - Interactive lecture / brainstorming / dialogue and discussion / assignment of tasks and reports / presentation of explanatory videos about the equipment operation, its components and uses Practical:- Assigning reports and seminars

week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2theorotic	a1 knows the	Forage prepare	Interactive	Daily quiz

		importance of green fodder and harvesting methods	and harvesting equipment	lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	and final examine
	3practical	b8 calibrate ,repair and maintained	Forage prepare and harvesting equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
2	2theorotic	a2 choosing suitable type of mower	Forage harvesting equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	b9 calibrate ,repair and maintained	Forage prepare and harvesting equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
3	2theorotic	a3 enumerates the mechanisms used in drying and turning green fodder	Forage prepare and harvesting equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	b10 calibrate ,repair and maintained	Forage prepare and harvesting equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical	Daily quiz and final examine

				exercises	
4	2theorotic	c1 can distinguishes between types of baler	Baler making and handling equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	b11 calibrate ,repair and maintained the equipment	Baler making and handling equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
5	2theorotic	a4 the student learns about the mechanisms of transporting and handling bales	Baler making and handling equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	b12 calibrate ,repair and maintained the equipment	Baler making and handling equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
6	2theorotic	a5 the student understands the work of the sillage harvester	Silage making and handling equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c5 calibrate ,repair and maintained the equipment	Silage making and handling equipment	Interactive lecture, brainstorming, dialogue and discussion,	Daily quiz and final examine

				field training, and practical exercises	
7	2theorotic	b1,a6 the student understands the working mechanism of silage handling equipment (fixed type)	Silage making and handling equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c6 calibrate ,repair and maintained the equipment	Silage making and handling equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
8	2theorotic	b2,c2 the student enumerates the types of balers for making fodder	Baler making and handling equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c7 calibrate ,repair and maintained the equipment	Baler making and handling equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
9	2theorotic	c3the student learns about dray feed and the mechanism of operation of all types of grander	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c8 calibrate ,repair and maintained the equipment	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue	Daily quiz and final examine

				and discussion, field training, and practical exercises	
10	2theorotic	c4 the student learns about feed mixer and compressed feed and equipment	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c9 calibrate ,repair and maintained the equipment	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
11	2theorotic	b3 the student enumerates the methods of handling feed inside cow barns	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c10 calibrate ,repair and maintained the equipment	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
12	2theorotic	b4 the student enumerates the methods of handling feed inside poultry barn	Dray forage making equipment	Interactive lecture, brainstormin g, dialogue and discussion, field training, and practical exercises	Daily quiz and final examine
	3practical	c11 calibrate ,repair and	Dray forage making	Interactive lecture,	Daily quiz and final

		maintained the equipment	equipment	brainstorming, dialogue and discussion, field training, and practical exercises	examine
13	2theorotic	b5 field visiting and preparing report on feed machines making	A field visit	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Report prepare
	3practical	c12 the student can see working this machines	A field visit	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Report prepare
14	2theorotic	b6 student report seminar	A field visit	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Report prepare
	3practical	c13 student report seminar	A field visit	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Report prepare
15	2theorotic	b7 student report seminar	A field visit	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Report prepare

	3practical	c14 student report seminar	A field visit	Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises	Report prepare

10. Course Evaluation

No.	Test type	date	grade	Rate
1	Theoretical + practical report	Week 13,14,15	6 theoretical +6 practical	12%
2	Quize	Week 1-12	5 theoretical +3 practical	8%
3	Midterm Exam (Theoretical+Practical)	Week 8	13 theoretical +7 practical	20%
4	Final Theoretical Examination	Final term examination	40	40%
5	Final Practical Examination	Final term examination	20	20%
6	Summation		100	100%

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	علي،لطفي حسين محمد وتوفيق فهمي دميان (1988) معدات مكننة الانتاج الحيواني،وزراة التعليم العالي والبحث العلمي ،جامعة بغداد،العراق.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

مدرس المادة

م.خالد عصام احمد

رئيس قسم المكائن والالات الزراعية

أ.م. نوفل عيسى محيميد

رئيس اللجنة العلمية

أ.د.عادل احمد عبد الله

Course Description Form

1. Course Name:
Agricultural Buildings
2. Course Code:
AGBU480
3. Semester / Year:
Autum/2024-2025
4. Description Preparation Date:
1st Fab. 2024
5. Available Attendance Forms:
Attendance + electronic
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours (2hours theoretical +3 hours practical) / 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Khalid E. Ahmed Mahmmod N. Abd Alkader
8. Course Objectives
The learner should be able to define the concept of buildings and the information that must be available for their optimal design **• Choosing the appropriateness of the factors affecting the planning and coordination of agricultural buildings** **• Differentiate between different planning systems and the appropriate ones** **• Distinguishing between types of buildings and their sections according to the purpose for which those buildings were built** **• Familiarity with the information the designer needs and what is available to him to construct buildings** **• The designer's awareness of the factors affecting agricultural buildings**
9. Teaching and Learning Strategies

Strategy	-Interactive lecture -Brainstorming - Dialogue and discussion -Field Training - Practical exercises - Field project

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2 theoretical	a1,b1 the student learns about agricultural buildings	introduction to agricultural buildings	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b7 the student uses building distributio n methods	distribution of buildings according to the united circles method	the audio-visual method uses the date show	quiz and midterm exam
2	2 theoretical	a2,c1 the student learns the basics of constructin g agricultural buildings	basics of building construction	the audio-visual method uses the date show	quiz and midterm exam
	3practical	a8 the student uses building distributio n methods	distribution of buildings according to wind direction	the audio-visual method uses the date show	quiz and midterm exam
3	2 theoretical	b2 the student learns about the types of thermal insulation	thermal insulation	the audio-visual method uses the date sho	quiz and midterm exam
	3practical	b9 the student learns to	thermal insulation	the audio-visual method uses the	quiz and midterm exam

		use isolation		date show	
4	2 theoretical	a3,b3 the student proposes a building plan	construction plan	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b10, the student learns about the building plan	construction plan	the audio-visual method uses the date show	quiz and midterm exam
5	2 theoretical	a4, the student enumerates the types of barns	types of barns		quiz and midterm exam
	3practical	b11, the student sees the types of barns	types of barns	the audio-visual method uses the date show	quiz and midterm exam
6	2 theoretical	b3,c2, the student recognizes the type of barn	barns with cubic	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b12, the student controls the dimensions of the bed according to the type	barns with cubic	the audio-visual method uses the date show	quiz and midterm exam
7	2 theoretical	a5,b4 the student calculates the dimensions of the barn	dimensions of barns with cubic	the audio-visual method uses the date show	quiz and midterm exam
	3practical	c5, the	dimensions of	the audio-	quiz and

		student controls the dimensions of the bed according to the type	barns with cubic	visual method uses the date show	midterm exam
8	2 theoretical	b5, the student calculates the dimensions of the cubic	calculating the dimensions of the shrine	the audio-visual method uses the date show	quiz and midterm exam
	3practical	c6, the student controls the dimensions of the bed according to the type	calculating the dimensions of the shrine	the audio-visual method uses the date show	quiz and midterm exam
9	2 theoretical	a5, the student identifies the type of barn	multi-section barns	the audio-visual method uses the date show	quiz and midterm exam
	3practical	c7, the student controls the dimensions of the bed according to the type	multi-section barns	the audio-visual method uses the date show	quiz and midterm exam
10	2 theoretical	a6, the student identifies the components of the barn	cow barns with stalls	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b13 the student	cow barns with stalls	the audio-visual method	quiz and midterm

		mentions the components of the barn		uses the date show	exam
11	2 theoretical	a7, the student knows the components of a barn	sheep pens	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b14 the student plans the barn	sheep pens	the audio-visual method uses the date show	quiz and midterm exam
12	2 theoretical	b7 the student is familiar with the methods of constructing protected buildings	green house	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b15 the student chooses the layout of the greenhouse	green house	the audio-visual method uses the date show	quiz and midterm exam
13	2 theoretical	b8 the student understands treatment methods	waste management in farm	the audio-visual method uses the date show	quiz and midterm exam
	3practical	b16 the student plans treatment methods	waste management in farm	the audio-visual method uses the date show	quiz and midterm exam
14	2 theoretical	b9 the student masters waste disposal	waste management in farm	the audio-visual method uses the date show	quiz and midterm exam

		methods			
	3practical	b17 the student distinguishes the types of tanks and treatment methods	waste management in farm	the audio-visual method uses the date show	quiz and midterm exam
15	2 theoretical	b10, the student prepares a report	a field visit	the audio-visual method	seminar
	3practical	b18, the student prepares a repor	A field visit	The audio-visual method	Seminar

1. Course Evaluation				
No.	Test type	date	grade	Rate
1	Theoretical + practical report	Week 15	5 theoretical +5 practical	10%
2	Theoretical quiz + practical quiz	Week 1- 14	Theoretical 2.5 +2.5 practical	5%
3	Midterm Exam (Theoretical+Practical)	Week 8	17.5 theoretical +7.5practical	25%
4	Final Theoretical Examination	Final term examination	40	40%
5	Final Practical Examination	Final term examination	20	20%
	Summation		100	100%

2. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	

Main references (sources)	Diary Freestall Housing And Equipment Housing Design For Cattle Farm Builbing Design House
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

م.خالد عصام احمد

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والالات الزراعية

رئيس قسم المكائن والآلات الزراعية

ا. م. نوفل عيسى مجيميد

رئيس اللجنة العلمية

أ.د. عادل احمد عبد الله

Course Description Form For Maintenance and Repair of Tractors

1. Course Name:	
Maintenance and Repair of Tractors	
2. Course Code:	
MART475	
3. Semester / Year:	
1st semester (4th class) 2024-2025	
4. Description Preparation Date:	
1 – 2 – 2025	
5. Available Attendance Forms:	
Attendance + online	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75 hr (2-3 hours) / 15 weeks (3.5) units	
7. Course administrator's name (mention all, if more than one name)	
Assistant Prof. Dr. Montaser Khairie Hussain ---------- Assistant Lecturer Mohamed Nathem Email: montaser.hussain@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	• Focus on safety standards during work to avoid accidents and ensure a safe working environment. • Teach students how to assess and understand the reasons for engine consumption and the wear of other components, and how this affects the efficiency of agricultural machinery. • Provide students with the necessary knowledge for performing effective routine maintenance to prolong the lifespan of agricultural tractors and associated equipment. • Learn detailed inspection and fault detection methods, including using appropriate techniques and tools to identify problems in different tractor parts. • Equip students with the skills to repair and maintain complex components such as the crankshaft, engine head, pistons, cylinders, and fuel system. • Learn how to inspect and maintain cooling and lubrication systems to avoid malfunctions that can lead to significant engine damage. • Develop the knowledge and skills needed to identify and repair problems in the transmission system and power transfer units, which are essential to the operational efficiency of agricultural tractors. • Provide opportunities for students to apply their knowledge in practical workshop environments to enhance their practical skills and readiness for industry participation after graduation.
9. Teaching and Learning Strategies	
Strategy	• Project-Based Learning (PBL): Assign students practical projects that simulate real problems in tractors and agricultural equipment, enabling them to apply theoretical knowledge in practical scenarios. • Collaborative Learning: Encourage students to work in groups to solve problems and complete projects. • Use of Technology: Employ technological tools such as virtual reality to visualize malfunctions and repairs or internet videos to design and modify spare parts. • Simulation and Experiments: Use simulation tools to train students on educational models before transitioning to actual equipment. • Hands-on Training On-Site: Provide opportunities for students to work in workshops or receive field training to face and handle challenges. • Continuous Formative Assessment: Regularly assess students through practical exams, quizzes, and term evaluations to monitor progress and provide immediate feedback. • Self-Learning and Research: Encourage students to research and read independently about the latest technologies and practices in maintenance and repair.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	a2 Students will be able to apply appropriate safety standards in the workplace, recognize potential hazards, and avoid injuries during repair operations.	**Safety During Repair**	Interactive lecture, discussion	Knowledge testing
	3	b3 Conduct a workshop training session on using personal protective equipment and safety procedures.			

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2	2	a2 Students will understand the reasons for engine wear and learn how to implement routine maintenance programs to extend engine life.	**Engine Wear and Routine Maintenance**	Interactive lecture, dialogue, discussion, observation	True/False Test
	3	b5 Train students to conduct routine engine inspections and assess its condition to identify early signs of wear.			
3	2	c4 Students will learn to use various inspection and diagnostic methods to identify machines and agricultural equipment faults.	**Inspection and Fault Detection Methods**	Interactive lecture, discussion	True/False Test
	3	b4 Practice using modern diagnostic tools to identify faults in engines and mechanical systems.			
4	2	a2 Students will develop an understanding of how to design, organize, and manage repair workshops for tractors and agricultural equipment.	**Tractor Repair Workshops**	Interactive lecture, discussion	Report writing
	3	b2 Organize a visit to a repair workshop to observe work organization and the techniques used.			
5	2	c4 Students will learn to identify factors that reduce engine efficiency and how to address them.	**Causes of Reduced Engine Efficiency**	Interactive lecture, discussion	Report discussion
	3	c4 Observe experiments on engines operating at different efficiencies to examine and analyze the possible causes of reduced efficiency.			
6	2	b4 Students will learn to inspect and repair the crankshaft and engine block head.	**Crankshaft Inspection and Repair, Engine Block Head Inspection and Repair**	Interactive lecture, discussion	True/False Test
	3	b1 Dismantle and reassemble the crankshaft and engine block head in the lab, focusing on inspecting the parts and how to repair them.			
7	2	Midterm Exam (Theoretical + Practical)			
	3				
8	2	a2 Learn how to open, inspect, and repair engine pistons and cylinders.	**Piston and Cylinder Opening, Inspection, and Repair**	Interactive lecture, discussion	True/False Test
	3	b4 Conduct dismantling of the piston and cylinders to inspect them for damage and discuss repair methods.			
9	2	c4 Students can inspect piston rings, repair them, and install them correctly.	**Piston Rings, Inspection, Repair, and Installation**	Interactive lecture, discussion	True/False Test
	3	b4 Practically inspect piston rings and learn how to replace and adjust them correctly.			
10	2	c4 Students will learn how to inspect and maintain the fuel system in diesel engines.	**Fuel System in Diesel Engines**	Interactive lecture, discussion	True/False Test
	3	b4 Inspect and repair fuel system parts for a diesel engine in the lab, including fuel pumps and injectors.			
11	2	c4 Students will acquire the necessary skills to inspect and repair fuel pumps and injectors.	**Fuel Pumps and Injectors Inspection and Repair**	Interactive lecture, discussion	True/False Test
	3	b4 Observe how to perform diagnostic tests and repairs on fuel pumps and injectors.			
12	2	a2 Students will learn how to inspect and maintain cooling and lubrication systems.	**Cooling and Lubrication Systems, Inspection and Repair**	Interactive lecture, discussion	True/False Test
	3	b3 Inspection and maintenance procedures for cooling and lubrication systems must be applied, including changing oil and filters.			
13	2	c6 Develop skills in diagnosing and repairing transmission system problems.	**Transmission System, Problems, and Repair**	Interactive lecture, discussion	Report writing
	3	b4 Train on identifying faults in the transmission system and repairing them.			

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
14	2	c4 Students will be able to identify problems in power transmission units and how to repair them.	**Power Transmission Units, Problems and Repair**	Interactive lecture, discussion, practical application	Report discussion
	3	a2 Practice diagnostic and repair techniques for power transmission units, focusing on the more complex parts, such as the hydraulic system.			
15	2	Midterm Exam (Theoretical+ Practical)			
	3				

11. Course Evaluation

	Assessment Methods	Evaluation Dates (Week)	Score	Relative Weight %
1	Quiz	Weeks 2, 6, 9, 11	5	5
2	Midterm Exam (theoretical)	Weeks 7, 15	20	20
3	Report Writing + Report Discussion + Short Quiz	Weeks 3, 5, 8, 10, 12, 13, 14	5	5
4	Midterm Exam (Practical)	Weeks 7, 14	10	10
5	Final Practical Exam	End-of-Term Exam	20	20
6	Final Theoretical Exam	End-of-Term Exam	40	40
	Total		100	100%

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Repairing agricultural tractors, Dr. Yassin Hashem Al-Tahan and Dr. Muhammad Jassim Al-Naama, 1992
Main references (sources)	Diesel Engines, Mahmoud Rabie Al-Malat, second edition, 1999
Recommended books and references (scientific journals, reports...)	A Textbook of Farm Machinery & Power Engineering-NIPA, Basavaraj, D Srigiri & Jayan P R, (2019)
Electronic References, Websites	YouTube

مدرس المادة النظري

أ.د. منتصر خيري حسين

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والالات الزراعية

رئيس قسم المكائن والالات الزراعية

أ.م. نوفل عيسى محيميد

رئيس اللجنة العلمية

أ.د. عادل احمد عبد الله

Course Description Form For Management of Agricultural Machineries

1. Course Name:	
Management of Agricultural Machineries	
2. Course Code:	
MAAM483	
3. Semester / Year:	
2nd semester (4th class) 2024-2025	
4. Description Preparation Date:	
1 – 2 – 2025	
5. Available Attendance Forms:	
Attendance + online	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75 hr (2-3 hours) / 15 weeks (3.5) units	
7. Course administrator's name (mention all, if more than one name)	
Assistant Prof. Dr. Montaser Khairie Hussain ---------- Lecturer Mahmood Natiq Abdulqader Email: montaser.hussain@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	• Comprehensive understanding of the goals of agricultural mechanization. • Full acquisition of knowledge in the fundamentals of agricultural machinery management. • Knowledge of the obstacles that limit the spread of agricultural mechanization in Iraq and ways to overcome them. • Deepening understanding of estimating fixed and variable costs and how to calculate the total costs of mechanized agricultural operations. • Estimating the performance of agricultural machinery and understanding the factors that affect it. • Learning methods to calculate the productivity rates of agricultural machinery and the elements that influence productivity. • Recognizing the factors that affect improving the performance and efficiency of agricultural machinery.
9. Teaching and Learning Strategies	
Strategy	• Active Learning: Encouraging students to actively participate in the educational process through classroom discussions, case studies, and hands-on training. • Project-Based Learning: Presenting project models and then asking students to apply the knowledge they have gained in analyzing them. • Blended Learning: Combining face-to-face sessions and online educational resources to provide a comprehensive educational experience. • Comprehensive Assessment: Using a variety of assessment methods such as exams, projects, presentations, and reports to effectively measure student progress.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding the objectives of agricultural mechanization.	Introduction to Agricultural Machinery Management	Interactive Lecture, Discussion	Pre-test
	3	Providing an introduction to the principles of agricultural machinery management.			
2	2	Knowledge of the objectives of agricultural mechanization and the fundamentals of machinery management.	Introduction to Agricultural Machinery Management Objectives of Agricultural Mechanization	Interactive Lecture, Discussion, Field Observation	Quiz
	3	Visiting and becoming acquainted with the components of agricultural mechanization.			
3	2	Analyzing obstacles and searching for solutions to address them.	Obstacles to the Spread of Agricultural Mechanization in Iraq	Interactive Lecture, Discussion	Writing a Report
	3	Explaining examples from the Iraqi reality.			
4	2	Knowledge of the fixed costs associated with agricultural machinery.	Fixed Costs	Interactive Lecture, Discussion, Solving Mathematical Questions	Information Survey
	3	Analysis and estimation of fixed costs.			

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
5	2	Knowledge of the variable costs associated with agricultural machinery.	Variable Costs	Interactive Lecture, Discussion, Solving Mathematical Questions	Quiz
	3	Analysis and estimation of variable costs.			
6	2	Knowledge of the different costs associated with agricultural machinery.	Calculating Total Costs	Interactive Lecture, Discussion, Solving Mathematical Questions	Homework Assignments
	3	Analysis and estimation of various costs.			
7	2	Applying knowledge in estimating the operating costs of tractors.	Operating Costs of Agricultural Tractors 1	Interactive Lecture, Discussion, Solving Mathematical Questions	First Midterm Exam (Theory) + (Practical)
	3	Performing mathematical calculations.			
8	2	Applying knowledge in estimating the operating costs of tractors.	Operating Costs of Agricultural Tractors 2	Interactive Lecture, Discussion, Solving Mathematical Questions	Homework Assignments
	3	Performing mathematical calculations.			
9	2	Analyzing and estimating the performance of agricultural machinery.	Estimating the Performance of Agricultural Machinery 1	Interactive Lecture, Discussion, Solving Mathematical Questions	Homework Assignments
	3	Performing mathematical calculations.			
10	2	Analyzing and estimating the performance of agricultural machinery.	Estimating the Performance of Agricultural Machinery 2	Interactive Lecture, Discussion, Solving Mathematical Questions	Quiz
	3	Performing mathematical calculations.			
11	2	Mastering productivity calculations and analyzing the factors that influence it.	Calculating Productivity Rates of Agricultural Machinery	Interactive Lecture, Discussion, Solving Mathematical Questions	Homework Assignments
	3	Performing mathematical calculations.			
12	2	Being able to evaluate the total costs of agricultural operations.	Calculating Costs of Agricultural Operations 1	Interactive Lecture, Discussion, Solving Mathematical Questions	Homework Assignments
	3	Being able to perform cost calculations for agricultural operations.			
13	2	Being able to evaluate the total costs of agricultural operations.	Calculating Costs of Agricultural Operations 2	Interactive Lecture, Discussion, Solving Mathematical Questions	Homework Assignments
	3	Being able to perform cost calculations for agricultural operations.			
14	2	Comprehensive understanding of the principles followed to maintain good management.	Fundamentals of Agricultural Machinery and Equipment Management	Interactive Lecture, Discussion, Solving Mathematical Questions	Second Midterm Exam (Practical)
	3	Visiting and evaluating management methods.			
15	2	Understanding and recognizing the factors that affect the improvement of performance	Improving Field Efficiency of Agricultural Machinery	Interactive Lecture,	Second Midterm

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		and efficiency of agricultural machinery.		Discussion, Field Observations	Exam (Theory)
	3	Applying strategies to improve performance and efficiency.			

11. Course Evaluation

	Assessment Methods	Evaluation Dates (Week)	Score	Relative Weight %
1	Quiz	Weeks 2, 6, 9, 11	5	5
2	Midterm Exam (theoretical)	Weeks 7, 15	20	20
3	Report Writing + Report Discussion + Short Quiz	Weeks 3, 5, 8, 10, 12, 13, 14	5	5
4	Midterm Exam (Practical)	Weeks 7, 14	10	10
5	Final Practical Exam	End-of-Term Exam	20	20
6	Final Theoretical Exam	End-of-Term Exam	40	40
	Total		100	100%

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Economics and management of agricultural machinery and equipment, (Al-Tahan, et.al. 1991)
Main references (sources)	-
Recommended books and references (scientific journals, reports...)	1- 15th International Congress on Agricultural Mechanization and Energy in Agriculture (2023) https://doi.org/10.1007/978-3-031-51579-8 2- Farm Machinery and Processes Management in Sustainable Agriculture. XI International Scientific Symposium (2022) https://doi.org/10.1007/978-3-031-13090-8 Advances in Agricultural Machinery and Technologies (2018)
Electronic References, Websites	YouTube

مدرس المادة النظري

أ.م.د. منتصر خيري حسين

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والآلات الزراعية

رئيس اللجنة العلمية: أ.د. عادل احمد عبد الله

رئيس القسم: أ.م. نوفل عيسى محيميد

Course Description Form

1. Course Name:
Seminar
2. Course Code:
SEMN404
3. Semester / Year:
Second Course 2024−2025
4. Description Preparation Date:
01−02−2025
5. Available Attendance Forms:
Attendance + Online
6. Number of Credit Hours (Total) / Number of Units (Total)
15 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Letcher: Dr. Mohammed Hussin Ahmed Al-Mola Email: dr.mohammedalmola@uomosul.edu.iq
8. Course Objectives
Course Objectives for theory part
1. The students realize the importance of scientific research 2. To be able to conduct and implement scientific research 3. To be able to write, arrange, and produce research in an academic manner 4. To be able to analyze data, prepare results, and present them in a scientific manner 5. To possess self-confidence, the ability to conduct calm dialogue, and had expert of the persuasion art
9. Teaching and Learning Strategies

Strategy of theory part	- Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and - Conduct a seminar

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1/ Theoretical	a1: Getting to know the concepts of the seminar to develop the student's ability to scientific presentation of any scientific topic	The concept and basics of the seminar	Interactive lecture, brainstorming, dialogue and discussion.	Discussions and brainstorming
2	1/	a2: What is the concept of scientific research and its	Scientific research and its	Interactive lecture,	Discussions and

	Theoretical	goals?	goals	brainstorming, dialogue and discussion.	brainstorming
3	1/ Theoretical	a1: What is the problem or research question and realizes the importance of defining the problem and the goal of defining it	Research problem, importance Research and research objectives	Interactive lecture, brainstorming, dialogue and discussion.	Discussions and brainstorming
4	1/ Theoretical	c2: Realizes the importance of hypotheses in scientific research and organizes the hypotheses for the episode accordingly	Research hypothesis and its characteristics	Dialogue and discussion.	Discussions and brainstorming
5	1/ Theoretical	a2: Learn about the methodology of scientific research c2: The seminar's methodology is organized according to the scientific method	Scientific research methodology	Dialogue and discussion.	Discussions and brainstorming
6	1/ Theoretical	a1: Learn about the types of research according to academic classifications c2: The loop is organized accordingly	Types of scientific research	Dialogue and discussion.	Discussions and brainstorming
7	1/ Theoretical	a1: Identify data, its types, and tools and methods for collecting and arranging data	Tools and methods for collecting data	Dialogue and discussion.	Discussions and brainstorming
8	1/ Theoretical	a2: Identifying and knowing the specifications of good research, which will determine the specifications of a good researcher	Specifications of a successful scientific researcher	Dialogue and discussion.	Discussions and short quiz
9	1/ Theoretical	c1: Organize data b2: Practice collecting data and putting it into tables or templates	The sample, its collection, and the steps for selecting the sample	Dialogue and discussion.	Discussions and brainstorming
10	1/ Theoretical	a1: Identify methods of tabulating that collected data c4: Analyze the data using a statistical program	Data classification and tabulation methods	Dialogue and discussion.	Discussions and brainstorming
11	1/ Theoretical	c2: Organizing tables, figures and appendices	Tables, figures and appendices	Dialogue and discussion.	Discussions and brainstorming
12	1/ Theoretical	c2: Organizing and writing sources according to international classifications of writing	How to write sources	Dialogue and discussion.	Discussions and brainstorming
13	1/ Theoretical	c2: Arranging sources according to templates or indexing forms	Indexing of sources	Dialogue and discussion.	Discussions and brainstorming
14	1/ Theoretical	b2: Practice using the computer d2: Create a slideshow presentation file using the computer	Knowledge of using slide show software on the computer	Interactive lecture, brainstorming, dialogue and discussion, self-	Discussions and short quiz

				learning	
15	1/ Theoretical	e3: Realizing the importance of self-confidence, calm dialogue, and the art of persuasion when delivering and discussing the seminar	Seminar presentation on PPT	Use an interactive display, smart board, or (Datashow)	A 20-minute seminar test with 40 minutes of student discussion

11. Course Evaluation

Evaluation Method	Evaluation Date	Evaluation Degree %	Evaluation Weight %
Quiz	Weeks 2-14	40	40
An evaluation form for five professors from the department attending the seminar	Week 14-15	60	60
total	After week 15	100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	----
Main references (sources)	- Kumar, Ranjit (2011) –Research Methodology A Step-by-Step, Chennai, India - Stapleton, Paul Stapleton; Anthony Youde Wei; Joy Mokonyane and Helen van Houten (1995) Scientific writing for Agricultural research, Published by the West Africa Rice Development Association
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Google scholar, Research Gate, Academia, Research Academy

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والالات الزراعية

رئيس قسم المكائن وآلات الزراعية

أ. م. نوفل عيسى محيميد

مدرس المادة النظري

د. محمد حسين احمد المولى

رئيس اللجنة العلمية

أ. د. عادل احمد عبد الله

Course Description Form

1. Course Name:

Electrical systems of tractors

2. Course Code:

ELST479

3. Semester / Year:

First semester (autumn)/2024−2025

4. Description Preparation Date:

1/2/2025

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 & Muhammad Nazim Abdullah
Email: hu_hamood@uomosul.edu.iq

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 and 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 discussion	Discussion quizzes
	3 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	A short practical test
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	quizzes
	3 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	A short practical test
3	2 Theoretical	a3: The student Identifies to the alkaline battery, the theory of its operation, and maintain it	alkaline battery	interactive lecture , Brainstorming, Dialogue discussion	Discussion quizzes
	3 Practical	b3: The student examines the alkaline battery and methods of maintaining it	Identify the student to the practical principles of battery inspection and maintenance	interactive lecture , and training	A short practical test
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 discussion	Discussion quizzes
	3 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 discussion	Discussion quizzes
	3 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	A short practical test
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 discussion	Discussion quizzes
	3 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	A short practical test
7	2 Theoretical	a7: The student Identifies to the starter, its malfunctions, and maintenance	the starter	interactive lecture , Brainstorming, Dialogue discussion	Discussion quizzes
	3 Practical	b7: The student tests the connection and maintenance of the starter	Identify the student to the practical principles of checking and maintaining the starter	interactive lecture , and training	A short practical test
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
	3 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	Light bulbs	interactive lecture , Brainstorming, Dialogue	Discussion quizzes

		installation, and how they work		discussion	
	3 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	reports about the visit
	3 Practical	b10: The student applies safety and security principles in the repair shop	Identify the student to the practical principles of safety and security while working in workshops	interactive lecture , and training	A short practical test
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 discussion	Discussion quizzes
	3 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	A short practical test
12	2 Theoretical	a12: The student Identifies to the side signal electrical circuit	Side signals	interactive lecture , Brainstorming, Dialogue discussion	Discussion quizzes
	3 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	A short practical test
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 discussion	Discussion quizzes
	3 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	A short practical test
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 discussion	Discussion quizzes
	3 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	A short practical test
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
	3 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 13 Practical: week 13	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	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

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

مدرس المادة العملي
م. م. محمد ناظم عبدالله

مدرس المادة النظري
م. حسين عبد حمود

جامعة الموصل
كلية الزراعة والغابات
قسم المكائن والآلات الزراعية

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

رئيس اللجنة العلمية
أ.د. عادل احمد عبدالله

Course Description Form

1. Course Name:
Research Project 1
2. Course Code:
REPR402
3. Semester / Year:
First semester (fall)/2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
45 practical hours / 1.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Email:
8. Course Objectives

Course Objectives	
9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 Practical	c1: The student chooses a subject for his research	Choose the research subject	Interactive lecture, brainstorming, dialogue and discussion	Reports
2	3 Practical	c4: The student proposes a plan for his research	Scientific research plan (research proposal)	Interactive lecture, dialogue and discussion	Reports
3	3 Practical	b1: The student documents the data and information collecte	Collect data and informations	Interactive lecture, dialogue and discussion	Reports
4	3 Practical	b2: The student chooses the samples and research tools requi	choose Samples and research tools	Interactive lecture, dialogue and discussion	Reports

5	3 Practical	c2: The student writes his graduation research in his own style	Procedures for writing research project	Interactive lecture, dialogue and discussion	Reports
6	3 Practical	a2: The student learns about the formal controls for his graduation research project	Formal controls in the research project	Interactive lecture, dialogue and discussion	Reports
7	3 Practical	a4: The student discusses with his supervisor the requirements for the theoretical part of the research	The theoretical part	Interactive lecture, dialogue and discussion	Reports
8	3 Practical	c2: The student gives examples of previous studies for his research	Presenting previous studies	Interactive lecture, presentation of previous studies	Reports
9	3 Practical	a3: The student presents to his supervisor the theories and scientific analysis of his subject	Theories and scientific analysis of the subject research	Interactive lecture, presentation of previous studies	Reports
10	3 Practical	a4: The student discusses with the supervisor the requirements of the practical part of the research	the practical part	Interactive lecture, dialogue and discussion	Reports
11	3 Practical	b3: The student tests the research data statistically	Analyze data statistically	Interactive lecture, reports and discussion	Reports
12	3 Practical	b3: The student tabulates statistical data for research	Writing tables	Interactive lecture, reports and discussion	Reports
13	3 Practical	a4: The student discusses his research data to derive useful tabular values	Results and conclusions	Interactive lecture, reports and discussion	Reports
14	3 Practical	b3: The student adopts the results of his research	Recommendations	Interactive lecture, reports and discussion	Reports
15	3 Practical	b1: The student presents the sources used in the research	Writing sources	Interactive lecture, reports and discussion	Reports

1. Course Evaluation

Seq.	Evaluating style	date	marks	Relative weight

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Methodical books
Main references (sources)	The central library at the university, the college library
Recommended books and references (scientific journals, reports...)	Research from specialized scientific journals
Electronic References, Websites	Research, letters and dissertations from the Internet.

جامعة الموصل
كلية الزراعة والغابات
قسم
المكائن والآلات الزراعية

مدرس المادة النظري

م. حسين عبد حمود

رئيس قسم المكائن والآلات الزراعية

أ.م. نوفل عيسى محيميد

رئيس اللجنة العلمية أ.د. عادل حمد عبد الله

Course Description Form

1. Course Name:
Research Project 2
2. Course Code:
REPR403
3. Semester / Year:
Second semester (spring)/2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
45 practical hours / 1.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Email:
8. Course Objectives

Course Objectives	
9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 Practical	c1: The student chooses a subject for his research	Choose the research subject	Interactive lecture, brainstorming, dialogue and discussion	Reports
2	3 Practical	c4: The student proposes a plan for his research	Scientific research plan (research proposal)	Interactive lecture, dialogue and discussion	Reports
3	3 Practical	b1: The student documents the data and information collecte	Collect data and informations	Interactive lecture, dialogue and discussion	Reports
4	3 Practical	b2: The student chooses the samples and research tools requi	choose Samples and research tools	Interactive lecture, dialogue and discussion	Reports

5	3 Practical	c2: The student writes his graduation research in his own style	Procedures for writing research project	Interactive lecture, dialogue and discussion	Reports
6	3 Practical	a2: The student learns about the formal controls for his graduation research project	Formal controls in the research project	Interactive lecture, dialogue and discussion	Reports
7	3 Practical	a4: The student discusses with his supervisor the requirements for the theoretical part of the research	The theoretical part	Interactive lecture, dialogue and discussion	Reports
8	3 Practical	c2: The student gives examples of previous studies for his research	Presenting previous studies	Interactive lecture, presentation of previous studies	Reports
9	3 Practical	a3: The student presents to his supervisor the theories and scientific analysis of his subject	Theories and scientific analysis of the subject research	Interactive lecture, presentation of previous studies	Reports
10	3 Practical	a4: The student discusses with the supervisor the requirements of the practical part of the research	the practical part	Interactive lecture, dialogue and discussion	Reports
11	3 Practical	b3: The student tests the research data statistically	Analyze data statistically	Interactive lecture, reports and discussion	Reports
12	3 Practical	b3: The student tabulates statistical data for research	Writing tables	Interactive lecture, reports and discussion	Reports
13	3 Practical	a4: The student discusses his research data to derive useful tabular values	Results and conclusions	Interactive lecture, reports and discussion	Reports
14	3 Practical	b3: The student adopts the results of his research	Recommendations	Interactive lecture, reports and discussion	Reports
15	3 Practical	b1: The student presents the sources used in the research	Writing sources	Interactive lecture, reports and discussion	Reports

1. Course Evaluation

Seq.	Evaluating style	date	marks	Relative weight

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Methodical books
Main references (sources)	The central library at the university, the college library
Recommended books and references (scientific journals, reports...)	Research from specialized scientific journals
Electronic References, Websites	Research, letters and dissertations from the Internet.

مدرس المادة النظري

م. حسين عبد حمود

رئيس قسم المكائن والآلات الزراعية

أ.م. نوفل عيسى محيميد

رئيس اللجنة العلمية أ.د. عادل احمد عبد الله

Course Description Form

1. Course Name:
Food Technology Equipment
2. Course Code:
FOTE478
3. Semester / Year:
First semester / 2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
On campus
6. Number of Credit Hours (Total) / Number of Units (Total)
2 Credit Hours (Theoretical approach), 3 Credit Hours (Practi approach)(75 Credit Hours)/ 2 units (Theoretical approach), 1.5 un (Practical approach) (3.5 Units)
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Adnan A. A. Luhaib Email: adnan.luhaib@uomosul.edu.iq Name: Asst. Lecturer. Ammar Wael Saleh Email: ammarwael1800@uomosul.edu.iq
8. Course Objectives
• Understanding the most important units and technical aspects in food processing facilities and teaching them how to distinguish between them. **• Acquiring comprehensive knowledge of all the manufacturing processes that take place in food processing facilities.** **• Enhancing students' knowledge of all the physical changes that occur in food processing facilitie and how to measure them.** **• Achieving a comprehensive understanding among students of all the thermal processes that occ in food processing facilities, methods of measurement, and how to operate their devices.** **• Identifying steam boilers and how to maintain and preserve them as heating units.** **• Understanding all thermal processes such as pasteurization and sterilization, how to operate different devices, and how to deal with occurring variables.**

• Knowing the most important components of refrigeration and freezing units used in food processing facilities, including their types.

• Having the ability to choose the appropriate environment for establishing a food processing plan

• Identifying the most important transportation units in food processing facilities, including pumps their types, and how they work.

• Achieving the ability to work on all devices within a food processing plant.

• Achieving the ability to design a suitable layout for a food processing plant, including planni execution, and monitoring by the end of the academic program.

9. Teaching and Learning Strategies

- Interactive Lecture
- Brainstorming
- Dialogue and Discussion
- Hands-on Training
- Field project

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 (Theoretica approach)	a1 The student should be familiar with the most important manufacturing equipment used in food production lines.	Introduction of food processing equipment	Auditory methods Writing style Direct dialogue style	Midterm exam 1 Final exam
	3 (Practical approach)	a8 Understanding the dimensions and units of measurement used in in food processing industry.	Units and Dimensions	Auditory methods Writing style Assignments	Quiz 1
2	2 (Theoretical approach)	a2 The student should understand the mechanics of material and energy balance.	Material and Energy Balance	Auditory methods Writing style Direct dialogue style	Midterm exam 1 Final exam
	3 (Practical approach)	a9 The student should be able to perform calculations related to material and energy balance.		Auditory methods Writing style Assignments	Quiz 2

3	2 (Theoretical approach)	a3 The student will be familiar with the operating mechanism of measuring devices used in food processing industry.	Measuring devices	Auditory methods Writing style Direct dialogue style	Midterm exam 1 Final exam
	3 (Practical approach)	b9 The student should be able to calibrate measurement devices.		Assignments, Reports	Report 1
4	2 (Theoretical approach)	a4 The student should be able to recognize heat, its transfer methods, and methods of controlling it.	Heat and its transfer methods	Auditory methods Writing style Direct dialogue style	Midterm exam 1 Final exam
	3 (Practical approach)	b10 The student learns about heating systems in food processing industry.	Heating systems	Auditory methods Writing style Assignments	Report 2
5	2 (Theoretical approach)	b1 The student should be able to estimate the mathematical operations related to heat measurement methods and control.	Heat, its measurement methods, and control	Auditory methods Writing style Direct dialogue style	Midterm exam 1 Final exam
	3 (Practical approach)	b11 The student will be familiar with the operating mechanism of steam boilers and its types.	Steam boilers	Auditory methods Writing style Direct dialogue style	Quiz 3
6	2 (Theoretical approach)	a5 The student learns about the principle of operation of heat exchangers and the calculation methods associated with it.	Heat exchangers	Auditory methods Writing style Direct dialogue style	Midterm exam 1 Final exam
	3 (Practical approach)	a10 The student becomes familiar with the types of pasteurization and sterilization equipment.	Pasteurization and sterilization equipment	Assignments, Reports	Quiz 1
7	2 (Theoretical approach)	b2 The student becomes acquainted with the operation mechanism of refrigeration and	Refrigeration and freezing	Auditory methods Writing style Direct dialogue	Midterm exam 2 Final exam

		freezing equipment.		style	
	3 (Practical approach)	b12 The student learns about the types of refrigeration and freezing equipment in food processing industry, as well as the associated calculations.	Refrigeration and freezing equipment	Assignments, Reports	Homework
8	2 (Theoretical approach)	a6 The student is able to understand the mechanism of evaporators in food processing industry, as well as the associated calculations.	Evaporation	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam Report 1
	3 (Practical approach)	b13 The student becomes familiar with the types of evaporators used in food processing industry.	Evaporators	Assignments, Reports	Homework
9	2 (Theoretical approach)	b3 The student is able to understand the mechanism and methods of food dehydration, as well as associated calculations in food processing industry.	Food dehydration	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam Report 2
	3 (Practical approach)	a11 The student learns about the types of food dryers.	Dryers in the food processing industry	Assignments, Reports	Homework
10	2 (Theoretical approach)	b4 The student is able to understand the mechanism of size reduction and sieving the solid materials	Size reduction and sieving the solid materials	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam Report 3
	3 (Practical approach)	a12 The student learns about the types of food size reduction and sieving the solid materials equipment.	size reduction and sieving the solid materials equipment	Assignments, Reports	Homework
11	2 (Theoretical approach)	b5 The student is able to understand the	Materials handling	Auditory methods	Midterm exam 2

		mechanism of materials handling.		Writing style Direct dialogue style	Final exam
	3 (Practical approach)	b14 The student learns about the types of material handling equipment.	Material handling equipment	Assignments, Reports	Homework
12	2 (Theoretical approach)	b6 The student is able to understand the mechanism of grains cleaning and grading	Grains cleaning and grading	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam
	3 (Practical approach)	a13 The student learns about the types of grains cleaning and grading equipment.	Grains cleaning and grading equipment	Assignments, Reports	Homework
13	2 (Theoretical approach)	a7 The student is able to understand the mechanism of food separation processes.	Food separation	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam
	3 (Practical approach)	a14 Instructional trip	Instructional trip	Assignments, Reports	Quiz 1
14	2 (Theoretical approach)	b7 The student becomes acquainted with the pumping process and the types of pumps which are used in food processing industry.	Pumping and its use in food processing industry	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam Quiz 2
	3 (Practical approach)	a15 The student is capable of estimating the efficiency of the pumping process, pump efficiency, and maintenance methods of it.		Assignments, Reports	Homework
15	2 (Theoretical approach)	b8 The student is able to understand the mechanism of food packaging in a food processing industry.	Food packaging	Auditory methods Writing style Direct dialogue style	Midterm exam 2 Final exam Quiz 3
	3 (Practical approach)	a16 The student becomes familiar		Assignments,	Industrial report

		with the packaging devices used in a food processing industry.		Reports	

11. Course Evaluation

	Evaluation method	Evaluation time (week)	Score	Relative weight
1	Practical report 1	Third week	2	2
2	Practical report 2	Fourth week	2	2
3	Practical report 3	Sixth week	2	2
4	Quiz 1	Sixth week	1	1
5	Quiz 2	Thirteenth week	1	1
6	Quiz 3	Fifteenth week	1	1
7	Midterm exam 1	Sixth week	8	8
8	Midterm exam 2	eleventh week	8	8
9	Report 1	Eighth week	2	2
10	Report 2	Ninth week	2	2
11	Report 3	Tenth week	2	2
12	Practical Quiz 1	First week	1	1
13	Practical Quiz 2	Second week	1	1
14	Practical Quiz 3	Fifth week	1	1
15	Industrial report	Fifteenth week	6	6
16	Homework	Weeks 6, 8, 9, 10, 11, 12, and 14	7	7
17	Practical final exams	Practical final exam	20	20
18	Theoretical final exams	Theoretical final exam	40	40
	Sum		100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Food Processing Engineering / Dr. Amer Hameed Al-Dahan
Recommended books and references (scientific journals, reports…)	Food Process Engineering and Technology Second Edition
Electronic References, Websites	

مدرس المادة النظري

م.د. عدنان عبد احمد

مدرس المادة العملي

م.م. عمار وائل صالح

رئيس قسم المكائن والالات الزراعية

أ.م. نوفل عيسى محيميد

رئيس اللجنة العلمية

أ.د. عادل احمد عبد الله

Course Description Form

1. Course Name:
Post Harvest Equipment
2. Course Code:
POHE482
3. Semester / Year:
Second semester 2024-2025
4. Description Preparation Date:
1/2/2025
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 / 3.5 Units
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq **Salih Sabrry Ali**
8. Course Objectives
1- Acquiring knowledge in improving post-harvest crop transactions and food processing to reduce losses in the agricultural field and open markets for national agricultural products that are compatible with international production and quality systems. **2- The ability to develop modern agricultural production systems in line with the general trend in production and market requirements for human resources capable of dealing with those systems.** **3 - The ability to improve post-harvest crop and food processing transactions** **4- Graduating agricultural engineers and researchers to serve the agricultural sector in the field of post-harvest equipment in the correct manner, with the aim of improving agricultural production processes in quantity and quality.**
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	a1 the student knows the importance of post-harvest equipment a5 and distinguishes between its different types	Introduction to the importance of post-harvest equipment	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	a2 the student classifies post-harvest equipment according to the order of operations for agricultural crops	Classification of post-harvest equipment according to the order of the stages that agricultural crops go through	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
2	2 theoretical	a1the student knows the types of agricultural trailers and loaders used in the fields	Equipment for handling and transporting agricultural products (trailers and loaders).	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	a2 the student learns how agricultural trailers work c3 and field experiments are being conducted on it	Practical field applications on agricultural trailers and loaders	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
3	2 theoretical	a2 the student classifies the types of vectors for agricultural crops a1 knows how each type and its parts work	The working mechanism of all types of conveyors (conveyor belt, chain, and auger)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	a2 the student understands the laws and mathematical equations about transporting materials using a conveyor belt, auger, and chain conveyor a3 the student solves mathematical problems various vectors	Solve mathematical exercises and problems about transporting materials by conveyor belt, auger, and chain conveyor	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
4	2 theoretical	a2the student understands techniques for clearing and grading agricultural crops	Techniques for cleaning and grading agricultural crops	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	a2 the student learns about the machines used to clean and grade seeds c5 evaluates the efficiency of its work	A field visit to one of the grain purification and grading plants to see first-hand the mechanism of its work	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
5	2 theoretical	a2 the student understands the techniques of cleaning	Cleaning techniques for agricultural crops	Interactive lecture, brainstorming, dialogue and	Short daily test1

		machines for agricultural crops		discussion, self-learning	Semester test1 Final test
	3 Practical	c3 the student conducts experiments on a laboratory grain cleaning device	Laboratory applications and experiments on the laboratory grain cleaning device	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
6	2 theoretical	a2 the student understands the basics of choosing cleaning machines for agricultural crops	Principles for choosing cleaning machines for agricultural crops	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on agricultural crop cleaning machines	Applications on regulations and standards for agricultural crop cleaning machines	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
7	2 theoretical	a2 the student learns about means of increasing the efficiency of seed cleaning machines during sifting	Means of increasing the efficiency of seed cleaning machines during sifting	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on seed cleaning machines	Practical laboratory applications and experiments to increase the efficiency of seed cleaning machines	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
8	2 theoretical	a2 the student learns about seed grading techniques a5 it distinguishes and distinguishes the basics of classification of seed grading machines	Seed grading techniques and basics of classification of seed grading machines	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on a laboratory seed grading device	Laboratory applications and experiments on the laboratory seed grading device	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
9	2 theoretical	a2 the student learns about grading machines according to seed length, size, and specific weight	Grading machines according to seed length, size and specific gravity	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on grading machines according to the length of the seed its size and specific gravity	Applications and laboratory experiments on grading machines according to seed length, size, and specific gravity	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
10	2 theoretical	a2 the student learns about grading machines based on the electrical and magnetic	Grading machines based on electrical energy And the magnetism and color of	Interactive lecture, brainstorming, dialogue and discussion, self-	Short daily test1 Semester

		energy and color of grains	the grains	learning	test1 Final test
	3 Practical	c3 the student conducts experiments on grading machines based on the electrical and magnetic energy and color of grains	Applications and laboratory experiments on grading machines based on electrical and magnetic energy and color of grains	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
11	2 theoretical	a2the student understands the importance of drying and adjusting seed moisture a5 it distinguishes and types of drying systems and machines	The importance of drying and adjusting seed moisture and types of drying systems and machines	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	a2 the student learns about the machines used to dry seeds c5 evaluates the efficiency of its work	A field visit to one of the seed drying plants to learn directly about the mechanism of its work	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
12	2 theoretical	a2the student understands seed drying systems a5 it distinguishes the different types of seed dryers	Seed drying systems Using different types of dryers	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on laboratory seed drying machines	Laboratory applications and experiments on laboratory seed drying machines	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
13	2 theoretical	a2 the student learns about sorting and grading machines and machines for fruits and vegetables	Machines and machines for sorting and grading fruits and vegetables	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on sorting and grading machines and machines for fruits and vegetables	Applications and practical experiments on sorting and grading machines for fruits and vegetables	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
14	2 theoretical	a2 the student learns about the machines and packing materials for fruits and vegetables	Packing machines and packing materials for fruits and vegetables	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c3 the student conducts experiments on packing machines for fruits and vegetables	Applications and practical experiments on packing machines for fruits and vegetables	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
15	2 theoretical	a2 the student learns about the mechanisms of preserving and storing	Preserving and storing agricultural products (all kinds of grains, fruits and vegetables)	Interactive lecture, brainstorming, dialogue and discussion, self-	Short daily test1 Semester

		agricultural products (all kinds of grains and fruits. a2 the student learns about vegetables)		learning	test1 Final test
	3 Practical	a2 the student learns about the mechanisms used to store grains in silos c5 evaluates the efficiency of its work	A field visit to the grain storage silo	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

10. 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-تكنولوجيا البذور 2006 د. عبد الستار الرجبو ود. احمد صالح 2-هندسة تصنيع المنتجات الزراعية 1989 د. عبد الحميد زكريا ود.مدحت عبدالله
Recommended books and references (scientific journals, reports...)	1-اعداد وتداول المحاصيل الزراعية 2013 د.عادل البهنساوي 2- هندسة تصنيع المنتجات الزراعية, د.صلاح عبداللطيف د.ماهر محمد إبراهيم
Electronic References, Websites	https://www.youtube.com

مدرس المادة العملي
م.م.صالح صبري علي

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

مدرس المادة النظري
م.أحمد محمدأمين سعيد

رئيس اللجنة العلمية
أ.د. عادل أحمد عبدالله

Course Description Form

1. Course Name:
Hydraulic System and Equipments
2. Course Code:
HYSE477
3. Semester / Year:
first semester 2024-2025
4. Description Preparation Date:
1/2/2025
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 / 3.5 Units
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq **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, and 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 hav 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 experiment 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 training, and self-learning	Short daily test1 Semester test1 Final test
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	Definition and classification	Interactive lecture,	Short daily test1

		hydraulic pumps are a2 defines the types, parts, and mechanism of action	**of hydraulic pumps (Types_parts_mechanism of action)**	**brainstorming, dialogue and discussion, self-learning**	**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 training, and self-learning**	**Short daily test1 Semester test1 Final test**
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**	**Hydraulic systems (open system, types and features)**	**Interactive lecture, brainstorming, dialogue and**	**Short daily test1 Semester test1 Final test**

		a1 and knows its types and features		discussion, self-learning	
	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 training, and self-learning	Short daily test1 Semester test1 Final test
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 maintaining hydraulic equipment	Practical applications and experiments on maintaining and sustaining hydraulic equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

10. 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 2009 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 العملي
م.م.عمار وائل

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

مدرس المادة النظري
م.أحمد محمدأمين سعيد

رئيس اللجنة العلمية
أ.د. عادل أحمد عبدالله

Course Description Form

1. Course Name:
Computer applications4
2. Course Code:
AGFM24_F4161
3. Semester / Year:
Autumn semester / 2024−2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
Blended learning (Attendance + Electronic)
6. Number of Credit Hours (Total) / Number of Units (Total):
3 practical hours/1.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Najla Matti Isaac Email: najla.matti@uomosul.edu.iq
8. Course Objectives

Course Objectives	• **Enable the student to become familiar with the SAS statistical program and its applications in agricultural experiments.** • **Enable the student to know and understand programs in the SAS language and apply the steps and procedures followed to use the SAS statistical program in analyzes of agricultural experiments.** • **Enabling the student to write programs in the SAS language for various agricultural and scientific experiments.** • **Providing the student with the skills of dealing with data types when writing programs in the SAS language.** • **Enabling the student to correct grammatical and linguistic errors that appear when implementing programs written in the SAS language** • **Enable the student to read, understand and interpret the results and outputs of implementing programs written in SAS.**

9. Teaching and Learning Strategies	
Strategy	1. Applying modern strategies for education. 2. Providing learners with many different skills and knowledge. 3. Increase students' ability to learn. 4. Diversity in methods and implementation of the curriculum in the teaching process, taking into account individual circumstances, abilities and potentials of learners. 5. Learning and teaching are carried out according to the latest self-education tools using computers and through modern programs in the fields of education. 6. Use effective modern teaching strategies that help all types of students participate in educational materials.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 practical	The student should be able to know and understand the nature and objectives of the SAS program and the tools necessary to analyze the data available in the program.	What is the SAS program - storing and retrieving information - modifying and programming data - writing reports - statistical analysis - processing records	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
2	3 practical	The student should be able to know and understand SAS windows and practical application therein	SAS windows - writing and loading the program window - program execution steps window - results window. Who uses SAS software? Why SAS	Lectures, audio materials, reports, and images with practical application of exercises and experiments	Exams, reports, discussions, quizzes

				using the SAS program	
3	3 practical	The student should be able to know, understand and practically apply the general steps for writing a SAS program.	General steps for writing a SAS program.	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
4	3 practical	The student should be able to know, understand, and practically apply the use of functions, their importance, and formulas for using them in writing a program in the SAS language.	Functions	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes Exams, reports, discussions, quizzes
5	3 practical	The student should be able to know, understand and practically apply to create new data from the input data set using mathematical operations or functions and the formulas for using them in writing a program in the	Create new data from an input data set using mathematical operations or functions.	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes

		SAS language.			
6	3 practical	The student should be able to know, understand and practically apply to generate statements using IF conditionals. The use of conditional statements to delete data from the data set and the formulas for using them in writing a program in the SAS language	- Generate data using IF conditional statements. - Using conditional statements to delete data from the data set in the program + scientific visit.	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
7	3 practical		Semester exam 1	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
8	3 practical	The student should be able to know, understand, and practically apply sorting and arranging data and the formulas used in writing a program in the SAS language.	- Sorting and arranging data Use the PROC SORT statement	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
9	3	The student	- Applications in	Lectures,	Exams,

	practical	should be able to know, understand and practically apply to find one-way and two-way frequency distribution tables and the formulas for using them in writing a program in the SAS language.	descriptive statistics - One-way frequency distribution table - Two-way frequency distribution table PROC FREQ	audio materials, reports, and images with practical application of exercises and experiments using the SAS program	reports, discussions, quizzes
10	3 practical	The student should be able to know, understand, and practically apply measures of averageness and dispersion and formulas for using them in writing a program in the SAS language.	-Measures of mediation and measures of dispersion. PROC MEANS	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
11	3 practical	The student should be able to know, understand and practically apply T-test formulas to use in writing a program in the SAS language	- Test of means and analysis of variance - t-test	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	
12	3 practical	The student should be able to know,	- Analysis of variance formula PROC ANOVA-	Lectures, audio materials,	Exams, reports, discussions,

		understand and practically apply the analysis of variance table and formulas to use in writing a program in the SAS language	- PROC GLM	reports, and images with practical application of exercises and experiments using the SAS program	quizzes
13	3 practical		Semester exam 2	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
14	3 practical	The student should be able to know, understand and practically apply to find the correlation coefficient and the formulas used in writing a program in the SAS language	PROC CORR correlation coefficient formula	Lectures, audio materials, reports, and images with practical application of exercises and experiments using the SAS program	Exams, reports, discussions, quizzes
15	3 practical	The student should be able to know, understand and practically apply to find the regression equation and the formulas for	PROC REG REGRESSION FORMULA	Lectures, audio materials, reports, and images with practical application of exercises and experiments	Exams, reports, discussions, quizzes

		using it in writing a program in the SAS language		using the SAS program	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

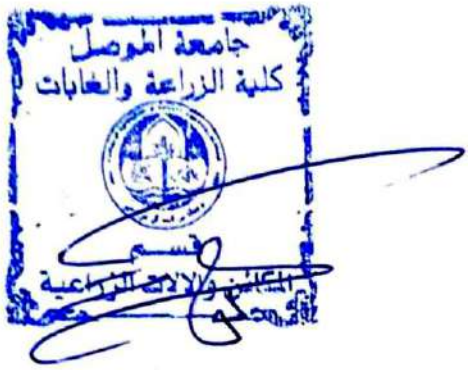
12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	A curriculum was prepared by computer professors at the college based on the SAS software guide.
Main references (sources)	- SAS software guide - A Handbook of Statistical Analyses using SAS. (authors: Geoff Der and Brian S. Everitt) Data analysis using the SAS statistical program, written by Dr. Firas Rashad Al-Samarrai
Recommended books and references (scientific journals, reports…)	Statistical analysis using the SAS package, prepared by: Abdullah Al-Shahrani
Electronic References, Websites	https://www.sas.com/en_sg/training/offers/free-training.html https://video.sas.com/detail/videos/how-to-tutorials https://www.udemy.com/course/sas-programming-for-beginners https://sascrunch.com/courses/sas-base-programming-for-absolute-beginners-free-version/

مدرسة المادة

نجلاء متي اسحق

اللجنة العلمية



رئيس القسم
أ.م. نوفل عيسى محميد

Course Description Form

1. Course Name:

Harvesting Equipment

2. Course Code:

HAEQ481

3. Semester / Year:

The second spring semester/fourth stage/2024-2025

4. Description Preparation Date:

1/2/2025

5. Available Attendance Forms:

in-person + online

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: Ghazwan Ahmed Dahham
Name: Othman Muayad Mohammed Tofeq
Email: ghazwanagr@uomosul.edu.iq

8. Course Objectives

• Identify the types of harvesters and combine harvesters and their uses
• Identify the advantages and disadvantages of agricultural harvesters of different types
• Identify the correct operational methods for each type of harvester
• Identify the basic parts of agricultural harvesters and their main functions
• Estimating the qualitative and quantitative losses resulting from the incorrect use of harvesters
• Identifying harvester malfunctions and how to calibrate them
• Operate harvesters in a scientific and correct manner

9. Teaching and Learning Strategies

- Interactive lecture
-Brainstorming
- Dialogue and discussion
-Field Training
- Practical exercises
- Field project
-Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2 Theoretical	a1: The student explains the importance and development of harvesting equipment and the classification of harvesters. The student acquires knowledge and concepts related to the importance and development of harvesting equipment.	The importance and development of harvesting equipment.	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Practical	b5: Checks and organizes procedures for calibrating the cutting unit. The student must be able to operate the harvesters in a scientifically correct manner	Regulations for the cutting unit	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
2	2 Theoretical	c1: Shows the main and auxiliary parts that make up the cutting unit and the function of each part. Shows the main parts that make up the threshing unit and the function of each part. The student acquires knowledge and concepts	Main and auxiliary parts of the grain harvester	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

		related to the main and auxiliary parts of the grain harvester			
	3 Practical	b6: Checks and organizes the procedures for calibrating the feeding unit. The student should be able to identify problems that reduce the efficiency of the harvesting process	Regulations for the feeding unit	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
3	2 Theoretical	b1: Determines the types of loss and its sources. The student acquires knowledge and concepts related to grain loss and its sources in combine harvesters	Grain loss and its sources in combine harvesters	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Practical	b7: Checks and organizes procedures for calibrating the threshing unit. The student should be able to choose the appropriate harvesting method according to the conditions and nature of the field to be harvested	Class unit regulations	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
4	2 Theoretical	a2: Yellow corn	Corn harvesting	Interactive lecture, brainstorming,	Semester exam 1,

		harvesting equipment is classified based on the technological processes of harvesting the yellow corn crop. The student acquires knowledge and concepts related to corn harvesting equipment	equipment	dialogue and discussion, self-learning	final exam
	3 Practical	b8: Checks and organizes procedures for calibrating the separating unit. The student should be able to estimate the qualitative and quantitative losses resulting from the incorrect use of harvesters	separating unit regulations	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1

5	2 Theoretical	C2: Shows the procedures, modifications and regulations that are performed on the grain harvester (Combine) to harvest the sunflower crop. It identifies the mechanical means used in harvesting the soybean crop. The student acquires knowledge and concepts related to oil crop harvesting equipment	Oil crop harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Practical	b9: Checks and organizes procedures for calibrating the cleaning unit The student should be able to identify harvester malfunctions	Regulations for the cleaning unit	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
6	2 Theoretical	b2: Determines the types of potato harvesting equipment. The student acquires knowledge and concepts related to equipment for harvesting tuber crops (potatoes).	Tuber crop (potato) harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam

	3 Practical	b10: Checks and organizes procedures for calibrating the filling and unpacking unit. The student should be able to monitor safety conditions when working on the harvester	Regulations for the packing and unpacking unit	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
7	2 Theoretical	c3: Compares sugar beet extracts from 1-3 lines The student acquires knowledge and concepts related to equipment for harvesting root crops (sugar beets)	Root crops harvesting equipment (beets, carrots)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Practical	b11: Loss before harvest, loss after harvest, and loss during harvest are calculated. The student should be able to monitor safety conditions when working on the harvester	Methods of calculating the components of harvest loss	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test1
8	2 Theoretical	c4: Shows the main and auxiliary parts of the integrated sugarcane harvester and the function of	Fiber crop harvesting equipment (sugarcane)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions

		each part. The student acquires knowledge and concepts related to equipment for harvesting fiber crops (sugarcane)			
	3 Practical	c7: Distinguishes harvesting methods with the Combine harvester. The student should be able to evaluate the functions of the units operating in the harvesters	Threshing harvesting methods for Combine grains	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
9	2 Theoretical	c5: Explains the three methods used in harvesting the flax crop in two separate stages. The student acquires knowledge and concepts related to equipment for harvesting fiber crops (flax)	Fiber crop harvesting equipment (flax)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3 Practical	b12: Explains the three methods used in harvesting the flax crop in two separate stages. The student acquires knowledge and concepts	Fiber crop harvesting equipment (flax)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions

		related to equipment for harvesting fiber crops (flax)			
10	2 Theoretical	b3: Explains the equipment for harvesting cotton by picking fibers from the nuts, The student acquires knowledge and concepts related to equipment for harvesting fiber crops (cotton).	Fiber crop harvesting equipment (cotton)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3 Practical	b13: Calculates the losses and their sources in yellow corn harvesting equipment. The student should be able to determine the date of uprooting the potato crop and the appropriate equipment for that	Loss and its sources in yellow corn harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
11	2 Theoretical	c6: Draws the equipment for harvesting cotton that has fallen to the ground. The student acquires knowledge and concepts related to the obstacles to the spread of low-lying	Scientific visit	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions

		crops			
	3 Practical	c8: Determines the principles used in maintaining the specialized corn harvester (Combine Corn) The student should be able to apply maintenance and storage rules for harvesters	Foundations used to maintain corn harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
12	2 Theoretical	a3: Knows the obstacles to the spread of low-crop harvest + types of low-crop harvest. The student acquires knowledge and concepts related to the types of harvest of low-lying crops	Obstacles to the spread of low-crop harvesting + Types of low-crops harvesting	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3 Practical	b14: Specifies the special modifications on the front of the combine for harvesting sunflowers, modifications on the threshing unit, and the arrangements of the separator unit and the cleaning unit. The student should be able	Harvester regulations for harvesting sunflower crops	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions

		to determine the date of harvesting the cotton crop and the appropriate tools according to what is required of the harvest			
13	2 Theoretical	a4: Knows the most important equipment used in harvesting lentils The student should be able to know the equipment for harvesting low-lying legume crops (lentils).	Harvesting equipment for low-lying legume crops (lentils)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3 Practical	c9: Explains the field management and equipment involved in the automatic harvesting of the potato crop The student should be able to determine the appropriate time for uprooting sugar beets and harvesting sugar cane, and the appropriate mechanisms and plows for that.	Management and maintenance of tuber crop harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
14	2 Theoretical	a5: Knows the most important equipment used in harvesting	Harvesting equipment for low-lying leguminous crops (peas)	Interactive lecture, brainstorming, dialogue and discussion, field	short exams, assignment of duty, discussions

		beans. The student should be able to know the equipment for harvesting low-lying leguminous crops (peas).		training, practical exercises, and self-learning	
	3 Practical	b15: Regulates the operating regulations and management of harvesting operations for the integrated sugarcane harvester The student will be able to organize and make appropriate adjustments to the Combine grain harvester to harvest the yellow corn crop.	Harvesting methods with equipment for harvesting and sustaining sugar crops	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
15	2 Theoretical	b4: Shows the most important modifications and regulations that are made to the grain thresher harvesters in harvesting the chickpea crop. The student should be able to know the equipment for harvesting low-lying legume crops (chickpeas).	Harvesting equipment for low-lying legume crops (chickpea)	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, and self-learning	short exams, assignment of duty, discussions
	3 Practical	b16: Sustaining cotton harvesting	Sustaining fiber crop harvesting equipment	Interactive lecture, brainstorming, dialogue and discussion, field	short exams, assignment of duty, discussions

		equipment is implemented The student should be able to determine the most appropriate mechanical methods for harvesting flax		training, practical exercises, and self-learning	

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%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Harvesting Equipment, Dr. A. R. Banna, 1st Addition, Dar Alkutub Publisher, Mosu Univ. Press, 1998
Main references (sources)	1- Harvesting Equipment, Dr. A. R. Banna, 1st Addition, Dar Alkutub Publisher, Mosu Univ. Press, 1998 2- Introduction to Agricultural Mechanization, R. N. Kaul, 1st Addition, Macmillan Publisher, Hong Konr Press, 1985
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

مدرس المادة النظري: م. غزوان احمد دحام

مدرس المادة العملي: م. عثمان مؤيد محمد

رئيس اللجنة العلمية: أ.د. عادل احمد عبد الله

جامعة الموصل
كلية الزراعة والغابات
قسم
المكائن والالات الزراعية

رئيس القسم: أ.م. نوفل عيسى محيميد

Course Description Plant Protection Equipment

1. Course Name:
Plant Protection Equipment
2. Course Code:
PLPE484
3. Semester / Year:
The second semester/4 stage/2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
in-person+ online
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: Muosab abd alwihid mohammed Email: goldenagr@uomosul.edu.iq Name: Othman Muayad Mohammed Email: Othman.mmt@uomosul.edu.iq
8. Course Objectives
• Identify the components and parts of plant protection equipment • Explaining the basics and principles of control equipment and their applications in various agricultural fields • Discussing each type of plant protection equipment for agricultural crop production (in terms of installation and function) • Make the necessary adjustments for various protective equipment in order to obtain the optimal use of these machines in order to achieve the goal of efficient use. • The ability to maintain, 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 carry out organizing and calibrating 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 Training - Practical exercises - Field project - Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	d4 Explains the role of protection equipment in the agricultural sector	The importance of using protective equipment and methods of applying it	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	d4 Learn about protective equipment	Classification of protective equipment	Reports	quiz homework discussions
2	2 Theoretical	d4 Explains the classification of protective equipment	Classification of protective equipment	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	d4 Mechanical control equipment	Mechanical control equipment	Reports	quiz homework discussions
3	2 Theoretical	C3 Shows the sections of chemical control equipment	Types of chemical control equipment	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	C3 Organizing hoeing equipment for work	Mechanical control equipment before and during planting	Reports	quiz homework discussions
4	2 Theoretical	C3 Sections and classification of sprinklers	Classification of sprinklers	Auditory methods Writing style Direct dialogue style	quiz homework discussions

	3 Practical	C3 Methods of attaching hoeing equipment	Mechanical control equipment in the presence of the growing crop	Reports	quiz homework discussions
5	2 Theoretical	C3 Explains the advantages and disadvantages of the chemical control method	Advantages and disadvantages of the spray control method	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	C3 Sustainability and maintenance	Chemical control has its advantages and disadvantages	Reports	quiz homework discussions
6	2 Theoretical	d4 Explaining the requirements that must be met by sprinklers	Requirements that must be met in sprinklers	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	d4 Laboratory and field sprinkler regulations	Spraying equipment functions and their most important classifications	Reports	quiz homework discussions
7	2 Theoretical	d4 Shows the most important parts of spray machines	The most important parts of spray machines	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	d4 Mathematical applications on performance rate	The most important parts of spray equipment	Reports	quiz homework discussions
8	2 Theoretical	d4 Shows the most important parts of spray machines	Types of pumps used in sprinklers	Auditory methods Writing style Direct dialogue style	final semester exams
	3 Practical	d4 Applications for calculating fountain drainage	Different models of spray machines	Reports	final semester exams
9	2 Theoretical	d4 Identify the types of ground sprinklers and their functions	Types of ground sprinklers and their functions	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	d4 Applications for calculating spray rate	Fogging equipment has its advantages and disadvantages	Reports	quiz homework discussions
10	2 Theoretical	C3 Explains the introduction of fogging machine	Classification of fogging machine	Auditory methods Writing style	quiz homework discussions

				Direct dialogue style	
	3 Practical	C3 Basic requirements for making exfoliators	The main parts that make up the filters and their types	Reports	quiz homework discussion
11	2 Theoretical	C3 Identify the types of ground fogging machine	Types of grou fogging machine a their functions	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	C3 Ground clearance organizations	Fog diffusers	Reports	quiz homework discussions
12	2 Theoretical	C3 Identify the types of smokers	Types of smokers and their functions	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	C3 Sustainability and maintenance	Field observations	Reports	quiz homework discussions
13	2 Theoretical	C3 Identify spraying and air blowing equipment	Spraying equipment and air fogging	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	C3 Public safety at work	Maintenance and maintenance for the purpose of storage and safety during work	Reports	quiz homework discussions
14	2 Theoretical	d4 Identify the designs required in spraying aircraft	Necessary considerations for the design and operation of spraying and fogging aircraft	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	d4 Scientific visit	Scientific visit	Reports	quiz homework discussions
15	2 Theoretical	C3 Explains the types of mechanical control equipment	Types of mechanical control equipment (hoeing)	Auditory methods Writing style Direct dialogue style	final semester exams
	3 Practical	C3 Calibrating manual and knapsack sprayers	The use of aircraft in pest control	Reports	final semester exams

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%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Control equipment / Suhail Barbara
Main references (sources)	Control equipment / Suhail Barbara
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

مدرس المادة العملي
عثمان مؤيد

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

مدرس المادة النظري
د. مصعب عبد الواحد محمد

رئيس اللجنة العلمية
أ.د. عادل احمد عبدالله

Course Description Form

1. Course Name:
Heavy Equipment
2. Course Code:
HEEQ476
3. Semester / Year:
The first semester/4 stage/2024-2025
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
in-person+ online
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: Muosab abd alwihid mohammed Email: goldenagr@uomosul.edu.iq Name: Mahmood natiq Email: manatiq9 @uomosul.edu.iq
8. Course Objectives
• Identify the components and parts of agricultural tractors, starting with the engine and the main and auxiliary devices it contains. • 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, ending with harvesting operations and the subsequent processes through which these agricultural products are prepared, whether for consumption or Storage. • Making the necessary adjustments to agricultural machines in order to obtain the optimal use of those machines in order to reach the intended use of those machines. • The ability to maintain, 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 carry out organizing and calibrating 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 Training
- Practical exercises
- Field project
- Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	a1/Identifying the types of soils with their different textures and their suitability in determining the type of machine required	Soil physical and mechanical characteristics	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Applications Mathematical About the physical and mechanical properties of soil	Reports	quiz homework discussions
2	2 Theoretical	b2/Identifying machines for dismantling soil and making trenches for different types of soil	Machines for loosening soil and making trenches	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applicati about soil dismantling trenching machines	Reports	quiz homework discussions
3	2 Theoretical	C3, b2/Choose a reclamation project	Identify the conditions that must be met in the soil to be reclaimed	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications for reclamation project selection	Reports	quiz homework discussions

4	2 Theoretical	c3,a1 /Bulldozer	Knowing the types of bulldozers and methods of cutting soil	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about bulldozer	Reports	quiz homework discussions
5	2 Theoretical	c3,a1 /Using the weapon at different angles to cut the soil, depending on the type of work	Methods of cutting soil using a bulldozer	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications on methods of cutting soil using a bulldozer	Reports	quiz homework discussions
6	2 Theoretical	b2/ Calculating the maximum and normal productivity of the bulldozer	Methods for calculating bulldozer productivity	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications on methods of calculating bulldozer productivity	Reports	quiz homework discussions
7	2 Theoretical	Shovel	Identify the types of Shovels and calculate their balance and the forces affecting them	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about shovels	Reports	quiz homework discussions
8	2 Theoretical	c3,b2/ Practical methods for using the loader and calculating the optimal number of trucks and loaders	Applications on practical methods for using shovel and calculating the optimal number of trucks and shovels	Auditory methods Writing style Direct dialogue style	final semester exams
	3 Practical	e3/Applications Mathematical	Mathematical applications on practical methods for using a truck and calculating the optimal number of trucks and shovels	Reports	final semester exams

9	2 Theoretical	C3/ Leveling mechanism (grader)	Identify the leveling mechanism (grader), the forces affecting it, and calculate its productivity	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about the settlement mechanism (grader)	Reports	quiz homework discussions
10	2 Theoretical	b2/Scriber	Identify the scriptor mechanism, the forces affecting it, and calculate its productivity	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about the script	Reports	quiz homework discussion
11	2 Theoretical	b2/Machines for digging irrigation and digging channels	Identifying machi for digging irrigat and drainage chann the forces affect them, and calculat their productivity	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about machines for digging irrigation canals and punctures	Reports	quiz homework discussions
12	2 Theoretical	power excavators	Identify of power excavators, the forces affecting, and calculate roductivity	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about power excavators	Reports	quiz homework discussions
13	2 Theoretical	c3/Hydraulic digging machines	Identify hydraulic digging machines, the forces affecting them, and calculate their productivity	Auditory methods Writing style Direct dialogue style	quiz homework discussions
	3 Practical	e3/Applications Mathematical	Mathematical applications about hydraulic digging machines	Reports	quiz homework discussions
14	2 Theoretical	c3/Identify of clam shell	Identify of clam shells, the forces affecting them, and calculate their	Auditory methods Writing style Direct dialogue	quiz homework discussions

			productivity	style	
	3 Practical	e3/Applications Mathematical	Mathematical applications about clam shell	Reports	quiz homework discussions
15	2 Theoretical	b2/Influencing force of clam shell	b2/Analysis of the forces affecting the bucket and different inclination angles	Auditory methods Writing style Direct dialogue style	final semester exams
	3 Practical	e3/Applications Mathematical	Mathematical applications on the force affecting the bucket clam shell	Reports	final semester exams

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%

12. 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	

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محمود ناطق

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