

Course Description Form

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| 1. Course Name: | Design of Agricultural Machinery |
| 2. Course Code: | DAMA383 |
| 3. Semester / Year: | Second Semester 2025–2026 |
| 4. Description Preparation Date: | 1/2/2026 |
| 5. Available Attendance Forms: | Attendance + Online |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | 90 hours /4 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 | <ul style="list-style-type: none">- 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 | <ol style="list-style-type: none">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 | |

| Theory | | | | | |
|--------|---------------------------|--|---|---|----------------------|
| Week | Hours/ lecture type | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2/ Theoretic al | 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 |
| 2 | 2/ Theoretic al | 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 | 2/ Theoretic al | 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 |
| 4 | 2 / Theoretic al | 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 |
| 5 | 2/ Theoretic al | 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 |
| 6 | 2 / Theoretic al | 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 |
| 7 | 2 / Theoretic al | 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 |
| 8 | 2 / Theoretic al | 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 |

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|----|------------------------|--|--|---|--------------------|
| 9 | 2 / Theoretic al | 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 |
| 10 | 2 / Theoretic al | 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 |
| 11 | 2 / Theoretic al | 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 |
| 12 | 2 / Theoretic al | 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 |
| 13 | 2 / Theoretic al | 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 |
| 14 | 2 / Theoretic al | 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 |
| 15 | 2 / Theoretic al | b2: getting to know twist moment diagrams on rotating axes | applying schemes Twist moments on the axis's rotary | Discussion, self- learning | Quiz discussion |

Experimental

| Week | Hours/ lecture type | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|---------------------------|-------------------------------|---|---|----------------------|
| 1 | 4/ Practical | : a11 solving problems | Practical: Solving stress issues and emotion | Interactive lecture, brainstorming, dialogue and discussion, self- earning | Quiz |
| 2 | 4 / Practical | a12 : solving problems | Solving stress issues And emotion | Interactive lecture, brainstorming, dialogue and discussion, self- earning | Quiz |
| 3 | 4/ Practical | a13: solving problems | Solving stress issues and emotion | Interactive lecture, brainstorming, dialogue and discussion, self- learning | Quiz discussion |
| 4 | 4 / | a14: examinations that | Conducting | Interactive lecture, | Quiz |

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|----|---------------|--|---|--|-----------------|
| | Practical | run on materials and metals before use | examinations Laboratory (shock and hardness) | brainstorming, dialogue and discussion, self-learning | discussion |
| 5 | 4 / Practical | a15: Conduct an experiment | Conducting shock, shock and hardness experiments practically | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 6 | 4 / 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 | 4 / Practical | b4: solving problems | solving Load problems spreader | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 8 | 4 / Practical | b5: solving problems | Solving power problems Shear and Bending moments | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 9 | 4 / Practical | a16: solve examples | Practical: solving Shear force problems Bending moments for inclined loads | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 10 | 4 / 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 | 4 / 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 | 4 / Practical | a18: more clarification Thresholds used in Designs T and I | solving theoretical problems Simple bending | Interactive lecture, brainstorming | Quiz discussion |
| 13 | 4 / Practical | a19: solve Examples rotating parts | solving theoretical problems Simple contortions | Interactive lecture, brainstorming, dialogue | Quiz discussion |
| 14 | 4 / Practical | b7: solve examples | solving theoretical problems minor sprains | Discussion, self-learning | Quiz discussion |
| 15 | 4 / 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

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|---|---|
| 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 |



[Signature]
 Dr. Sabah Muhammad Jameel Ali
 Professor

[Signature]
 Dr. Sabah Muhammad Jameel Ali
 Professor

[Signature]
 Dr. Sabah Muhammad Jameel Ali
 Professor

[Signature]
 Dr. Sabah Muhammad Jameel Ali
 Professor

Course Description Form

| 1. Course Name: | | | | | | |
|--|------------------------|---|--|----------------------------|---|-------------------|
| Design and Analysis of Agricultural Experiment | | | | | | |
| 2. Course Code: | | | | | | |
| DAAE302 | | | | | | |
| 3. Semester / Year: | | | | | | |
| 2025 – 2026 Second Semester (Spring). | | | | | | |
| 4. Description Preparation Date: | | | | | | |
| 1 / 2 / 2026 | | | | | | |
| 5. Available Attendance Forms: | | | | | | |
| Attendance + electronic | | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | | |
| 60 hours (2 theoretical, 2 practical) / 3 units | | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | | |
| Name: Ahmed Majeed Abdulaah / Dhafr Abdul Razak Farhan Email: ahmed3079@uomosul.edu.iq / Dhufir.Al-Najmawi@uomosul.edu.iq | | | | | | |
| 8. Course Objectives | | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> 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 | | <ul style="list-style-type: none"> - 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 | Recalls statistical symbols and measures of mediation and dispersion | General statistical review | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | b5 | Performs a general statistical review | General statistical review | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |

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|----|------------------------|---|---|---|----------------------|
| 2 | Theoretical (2) | b1 Shows the concept of experimental design and some definitions related to the design and analysis of experiments | definitions Full random design, complete random sectors, and Latin square | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | a3 Recalls the types of designs used in agricultural experiments | Types of designs used in agricultural experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 3 | Theoretical (2) | c1 Demonstrates what a complete random design is | Complete Randomized Design (CRD) | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | b6 the complete random design CRD | Complete Randomized Design (CRD) | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 4 | Theoretical (2) | c2 shows the equation of the mathematical model and estimates the components of the mathematical variance | Equation of the mathematical model and estimation of its components | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | c6 the components of variance | Variance Components | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| 5 | Theoretical (2) | d1 Demonstrates the advantages and disadvantages of designing complete random Blocks | Randomized Complete Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | c7 Shows what is the design of complete random blocks RCBD | Randomized Complete Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| 6 | Theoretical (2) | d2 Organizes and analyzes a table of statistical data | of contrast components – missing observations – Relative efficiency of design | Interactive lecture and brainstorming, dialogue, and discussion | 1 st Exam |
| | Practical (2) | b7 Identifies methods of data collection and analysis statistically | Variation Components – Estimating Missing Observation Values – Estimating the Relative Efficiency of Design | Interactive lecture and brainstorming, dialogue, and discussion | 1 st Exam |
| 7 | Theoretical (2) | b2 Enumerates the advantages and disadvantages of the Latin square | Latin Square Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| | Practical (2) | b8 Shows what is the design of the Latin LSD box | LSD Latin Square Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 8 | Theoretical (2) | a2 Explains how to use the three designs 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 (2) | c8 Visits the research station of the field crops department to learn about the designs used in agricultural experiments | 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 Distinguish between methods of testing averages | of comparisons between averages of transactions | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | d5 Uses methods of testing and comparing averages | of testing and comparing averages | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| 10 | Theoretical (2) | d3 Shows what factorial experiments are and when to use | efficiency and lost viewing of LSD design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Report |
| | Practical (2) | c9 the first part of factor experiments | first part of factorial experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 11 | Theoretical (2) | b3 Explains factor experiments and what is the concept of interaction between factors | first part of factorial experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Report |
| | Practical (2) | d6 The second part of the factor experiments shows | second part of factorial experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 12 | Theoretical (2) | c4 Determines how data is collected and tabulated for the purpose of | second part of factorial experiments | Interactive lecture and brainstorming, dialogue, and | Quiz |

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| | | statistical analysis | | discussion | |
| | Practical (2) | b9 Suggests a method for collecting and analyzing data statistically | collection and analysis statistically | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 13 | Theoretical (2) | b4 Demonstrates the importance of interference in factorial experiments | Interaction in factor experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | a4 Recognizes the overlap between factors through a table of analysis of variance and graph | Interaction between factors through Anova table and graph | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 14 | Theoretical (2) | c5 Determines when to use splinter plate system factor experiments | Split-plot Experiments | Interactive lecture and brainstorming, dialogue, and discussion | 2 nd Exam |
| | Practical (2) | a5 experiments with splinter plate system | Split-plot Experiments | Interactive lecture and brainstorming, dialogue, and discussion | 2 nd Exam |
| 15 | Theoretical (2) | d4 Organizes a report on how to take measurements of traits | How to take measurements of traits and put them in tables | Interactive lecture and brainstorming, dialogue, and discussion | Write a report |
| | Practical (2) | b10 Writes a report on how measurements of traits are taken in the field and placed in tables | How to take measurements of traits in the field and put them in tables | Interactive lecture and brainstorming, dialogue, and discussion | Write a report |

11. Course Evaluation

| No. | Evaluation Methods | Evaluation (week) | Date | Degrees | Relative weight |
|-----|-------------------------------|-------------------------|------|---------|-----------------|
| 1 | A report 1 | fourth week | | 2.5 | 2.5 |
| 2 | A report 2 | fifth week | | 2.5 | 2.5 |
| 3 | Short test (1) Quiz | sixth week | | 2 | 2 |
| 4 | Short test (2) Quiz | The fourteenth week | | 2 | 2 |
| 5 | Short test (3) | The fifteenth week | | 1 | 1 |
| 6 | semester test (1) | sixth week | | 7.5 | 7.5 |
| 7 | semester test (2) | eleventh week | | 7.5 | 7.5 |
| 8 | Final theoretical test | Final theoretical exam | | 40 | 40 |
| 9 | Practical field project | The fifteenth week | | 5 | 5 |
| 10 | Laboratory evaluation | third and fifth week | | 2 | 2 |
| 11 | Practical short test (1) Quiz | First week | | 1 | 1 |
| 12 | Practical short test (2) Quiz | fourth week | | 0.5 | 0.5 |
| 13 | Practical short test (3) Quiz | The fourteenth week | | 1 | 1 |
| 14 | Live drawings and homework | 6,8,9,10,11,12,13 weeks | | 5.5 | 5.5 |
| 15 | Final practical test | Final practical exam | | 20 | 20 |
| | Total | | | 100 | 100% |

12. Learning and Teaching Resources

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| 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 |



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| | | | illustrated pictures, and laboratory models | discussion, self-learning | |
| 4 | 2 Theory | a1,a2: Remembers and understands the topic | Basic concepts of reciprocating engines | Interactive lecture, brainstorming, dialogue and discussion | Exams, |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 | Engine cycles(Diesel and dual cycle) | Interactive lecture, brainstorming, dialogue and discussion | Exams, homework |
| | 2 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 |
| | 2 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 |
| | 2 Practice | a2,a3: Understands and solves problems related | Solve problems related to the topic | Interactive lecture, brainstorming, dialogue and | Exams, homework |

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| | | to the topic | | discussion, self-learning | |
| 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 |
| | 2 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 |
| | 2 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, |
| | 2 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

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|--|---|
| 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, 2 nd ed., John Wiley and Sons, 2001 |
| Recommended books and references (scientific journals, reports...) | ----- |
| Electronic References, Websites | ----- |



Course Description Form

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| 1. Course Name: |
| Orchard Machinery and Crop service |
| 2. Course Code: |
| OMCS 381 |
| 3. Semester / Year: |
| Second Semester (Spring) 2025-2026 |
| 4. Description Preparation Date: |
| 1-2-2026 |
| 5. Available Attendance Forms: |
| blended learning (Physical + Electronic) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 2 hours of theory and 2 hours of practical, for 15 weeks, making a total of 60 hours / 3 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 Email: ammarwael1800@uomosul.edu.iq |
| 8. Course Objectives |
| Course Objectives for theory part |
| <ul style="list-style-type: none">- 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 |
| <ul style="list-style-type: none">- 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

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|-----------------------------------|---|
| Strategy of theory part | <ul style="list-style-type: none"> - Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting - Displaying real models of orchard mechanization equipment and machines |
| Strategy of practical part | <ul style="list-style-type: none"> - 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 | a1: 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? c3: Choosing the most appropriate method for each | Equipment for land reclamation in small and large orchards | Dialogue and writing style on smart board | Discussions and short quiz |

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|---|---|---|---|---|----------------------------|
| | | land preparation process | | | |
| 4 | 2 | a1: The student learns what soil preparation equipment is? c3: Choose the most suitable soil preparation | Soil preparation equipment for orchards | Dialogue and writing style on smart board | Discussions and short quiz |
| 5 | 2 | a1: The student learns about the principle of making plants and seedlings c1: 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 | a1: The student learns the principle of working of excavators for planting seedlings c1: 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 | a1: The student learns about fertilization processes and the concept of sprinkler or drip irrigation c2: 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 | a1: The student learns about the working principle of pest control machines c1: Explain how it can be used to extinguish fires | Pest control and Aerial fire control | Dialogue and writing style on smart board | Discussions and short quiz |
| 9 | 2 | a1: The student learns about the principle of | Branch pruning and trimming equipment | Dialogue and writing style on smart board | Discussions and short quiz |

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|----|---|---|---|---|----------------------------------|
| | | operation of pruning and trimming machines c1: Explain how to choose the most appropriate machine | | | |
| 10 | 2 | a1: The student learns about the concept of cutting c1: Determine tree fall calculations | Equipment for cutting logs | Dialogue and writing style on smart board | Discussions and short quiz |
| 11 | 2 | a1: The student learns the concept of transportation c1: 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 | a1: The student learns the principle of operation of tree uprooting and stump processing machines c1: 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 | a1, c2: 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 dialogue and discussion | Discussion report and short test |
| 14 | 2 | a1: The student learns about the concept of the work of vegetable harvesters c3: 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 | a1: The student learns about the | Fruit harvesting equipment | Dialogue and writing style on | Discussions and short quiz |

| | | | | | |
|-----------------------|--------------|--|---|---------------------------|----------------------------|
| | | concept of the work of fruit harvesters c3: Shows how to calculate productivity | | smart board | |
| Practical part | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning meth | Evaluation meth |
| 1 | 2 | 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 practical tasks | Discussions and short quiz |
| 2 | 2 | b2: The student applies the processes of leveling and amending orchard land with appropriate equipment | Calibration and maintenance of Orchard land Reclamation equipment | Assigning practical tasks | Discussions and short quiz |
| 3 | 2 | b3: Gains experience in attaching, operating and organizing plows | Calibration and maintenance Primary tillage equipment | Assigning practical tasks | Discussions and short quiz |
| 4 | 2 | b4: Gain experience in connecting, operating and organizing smoothing equipment | Calibration and maintenance Secondary tillage equipment | Assigning practical tasks | Discussions and short quiz |
| 5 | 2 | b4: The student applies the process of operating and organizing seeds and seedlings | Calibration and maintenance of Seeds and seedlings | Assigning practical tasks | Discussions and short quiz |
| 6 | 2 | b4: Gain experience in connecting and operating core excavators | Organizing and maintaining Drilling equipment | Assigning practical tasks | Discussions and short quiz |
| 7 | 2 | b4: Gains experience in operating and organizing | Organizing and maintaining Fertilization and Irrigation | Assigning practical tasks | Discussions and short quiz |

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|----|---|---|--|----------------------------------|---|
| | | fertilization and irrigation equipment | equipment | | |
| 8 | 2 | b4: Gains experience in connecting, operating and organizing control machines c1: Calculates the spray rate of the sprinkler | Calibration and maintenance of Pest and Aerial fire control | Assigning practical tasks | Discussions and short quiz |
| 9 | 2 | b4: Gains experience in attaching, operating and organizing pruning and trimming equipment | Organize pruning and trimming equipment | Assigning practical tasks | Discussions and short quiz |
| 10 | 2 | b4: Gain experience in connecting, operating and organizing equipment for cutting and dropping tree trunks | Organizing and maintaining cutting equipment | Assigning practical tasks | Discussions and short quiz |
| 11 | 2 | b4: Gains experience in attaching, operating and organizing log processing and transport equipment | Organizing and maintaining transport equipment | Assigning practical tasks | Discussions and short quiz |
| 12 | 2 | b4: 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 practical tasks | Discussions and short quiz |
| 13 | 2 | b4: 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 dialogue and discussion | Discussion of the report and a short test |
| 14 | 2 | b4: Gains experience in | Organizing and maintaining | Assigning practical tasks | Discussions and short quiz |


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|----|---|--|---|---------------------------|----------------------------|
| | | connecting, operating and organizing vegetable harvesters | vegetable harvesting equipment | | |
| 15 | 2 | b4: Gains experience in attaching, operating and organizing fruit harvesters | Organizing and maintaining fruit harvesting equipment | Assigning practical tasks | Discussions and short quiz |

11. Course Evaluation

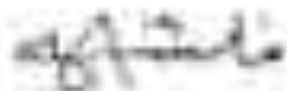
| Theoretical evaluation method | | evaluation date | evaluation degree |
|-------------------------------|---|-----------------|-------------------|
| 1- | Monthly test | Week 9 | 10 % |
| 2- | Quiz | Weeks 1-15 | 10 % |
| 3- | Report | Week 13 | 5 % |
| total | | | 25 % |
| Practical evaluation method | | 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) |


Director of Technical Part
Dr. Haim Alshaker, Yotvata, 1981


Director of Practical Part
Mr. Avner Matar, 1981


Chairman of the Scientific Committee
Prof. Dr. Shmuel Yagupsky


Director of Agricultural Machines and
Equipment
Prof. Dr. Avner Matar



Course Description Form

| |
|---|
| 1. Course Name: |
| Irrigation and Drainage Equipment |
| 2. Course Code: |
| IRDE382 |
| 3. Semester / Year: |
| Second semester 2025–2026 |
| 4. Description Preparation Date: |
| 1/2/2026 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +60 practical hours =90 hours / 4 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 mahmoud.h.r@uomosul.edu.iq |
| 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 A2 Understands 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 | Semester test1 Final test |
| | 4 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 | test1 Final test |
| 2 | 2 theoretical | A2 The 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | test1 Final test |
| 4 | 2 theoretical | A2 The student learns about turbine and submersible pumps A2 and classifies its types C1 and enumerates its features and parts | Turbo and submersible pumps, their types, advantages, disadvantages, and parts | Interactive lecture, brainstorming, dialogue and discussion, self-learning | test1 Final test |
| | 4 Practical | B3 The student applies the | Installing and operating | Interactive lecture, | test1 |

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|---|---------------|---|---|--|--|
| | | 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 | pumps Turbine and submersible turbines, their maintenance and maintenance | brainstorming, dialogue and discussion, field training, and self-learning | 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 test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 coefficient. | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | test1 Final test |
| 8 | 2 theoretical | A2 The student learns about | Irrigation by artillery | Interactive lecture, | test1 |

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|----|---------------|---|--|--|--|
| | | the artillery sprinkler irrigation system A2 and its types are classified C1 and enumerates its features and parts | sprinkler, its types and parts Its features and methods of installation and operation | brainstorming, dialogue and discussion, self-learning | Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 test2 test1 Final test |
| | 4 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 | test1 Final test |
| 11 | 2 theoretical | A2 The student learns about the circular (pivot) sprinkler irrigation system. A2 and its types are | Circularly moving sprinkler irrigation (pivotal), its types, parts, features and methods | Interactive lecture, brainstorming, dialogue and discussion, self- | test1 Final test |

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|----|---------------|---|---|--|---------------------|
| | | classified C1 and enumerates its features and parts | Install it and run it | learning | |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |

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|----|---------------|---|---|--|--|
| | 4 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 | 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 test3 test1 Final test |
| | 4 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 | Semester test1 Final test |

1. Course Evaluation

| Seq. | Evaluating style | date | marks | Relative weight |
|------|------------------------|-------------------|-------|-----------------|
| 1 | Home reports | every 5 weeks | 10 | 10% |
| 2 | Short tests | every 5 weeks | 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) | <p>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 نواردة و حسن محمد حسيني</p> |
| Recommended books and references (scientific journals, reports...) | <p>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 واليزل . د. عبدالرزاق عبداللطيف و د.شذى ماجد نفاوة 2017</p> <p>5- Irrigation Systems Engineering , Dr. A. Y. HACHEM & H. Ismaail ,st Addition, Dar Alhikma Publisher, Mosul Univ. Press, 1992</p> |
| Electronic References, Websites | https://www.youtube.com |



Course Description Form

| 1. Course Name: | | | | | |
|--|------------------|--|--|--|-------------------------------|
| Mechanics of tractors performance | | | | | |
| 2. Course Code: | | | | | |
| METP380 | | | | | |
| 3. Semester / Year: | | | | | |
| Second semester (spring)/2025–2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Combined (Attendance + distance education) | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hours (30 theoretical hours + 60 practical hours) / 4 units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Assis. Professor Mothana Abedalmalik Noori Email: moth1973@uomosul.edu.iq Name: Asst. Lecturer. Ammar Wael Saleh Email: ammarwael1800@uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> – Graduating agricultural engineers and researchers to serve the agricultural sector. – Scientific cooperation with 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, | Reports, Quizzes, Discussions |

| | | | | | |
|---|------------------|--|--|---|-------------------------------|
| | | | | smart boards | |
| | 4 Practical | c1: Solve mathematical examples of the forces acting on the tractor while standing and moving | Applications and mathematical problems on the forces affecting the tractor at rest and in motion. | Interactive lecture, dialogue and discussion, field training and practical | Reports, Quizzes, Discussions |
| 2 | 2 Theoretical | a2: Explains and clarifies through lectures | Soil strength – ultimate traction force. | attendance lectures using display devices: data shows, smart boards | Reports, Quizzes, Discussions |
| | 4 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 |
| | 4 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. Fuel consumption – Specific fuel consumption | Interactive lecture, dialogue and discussion, field training and practical | Reports, Quizzes, Discussions |
| | 4 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 As well as with regard to fuel consumption and specific fuel consumption | Interactive lecture, dialogue and discussion, field training and practical As well as regarding fuel consumption and specific fuel consumption | 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 |
| | 4 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 |
| | 4 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 | a7: Explains and clarifies | Methods used to | attendance | Reports, |

| | | | | | |
|----|---------------|---|---|--|-------------------------------|
| | Theoretical | through lectures | determine the location of the center of gravity of the tractor (suspension - balancing - weight). | lectures using display devices: data shows, smart boards | Quizzes, Discussions |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 Practical | c10: Apply mathematical examples from the | reports, quizzes, discussions | Interactive lecture, dialogue and | Reports, Quizzes, |

| | | | | | |
|----|---------------|---|--|--|-------------------------------|
| | | previous topics | | discussion, field training and practical | Discussions |
| 14 | 2 Theoretical | a14: Explains and clarifies through lectures | Mechanism of operation of the differential system - types of final reduction systems+ Hydraulic system. | attendance lectures using display devices: data shows, smart boards | Reports, Quizzes, Discussions |
| | 4 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 |
| | 4 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 |


د. هاني الفاييز
مدير مركز البحوث


د. هاني الفاييز
مدير مركز البحوث




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مدير مركز البحوث


د. هاني الفاييز
مدير مركز البحوث

Course Description Form For Management of Agricultural Machinerics

| 1. Course Name: | | | | | |
|---|--|---|--|---|--------------------|
| Management of Agricultural Machinerics | | | | | |
| 2. Course Code: | | | | | |
| MAAM483 | | | | | |
| 3. Semester / Year: | | | | | |
| 2 nd semester (4 th class) 2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1 – 2 – 2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Attendance + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hr (2-4 hours) / 15 weeks (4) units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Yousif Yakoub Hilal Email: yousif.yakoub @uomosul.edu.iq Mahmood natiq Email: manatiq9 @uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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) |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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) |
| | 4 | 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) |
| | 4 | 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

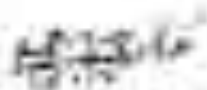
| | |
|--|--|
| Required textbooks (curricular books, if any) | Economics and management of agricultural machinery and equipment, (Al-Tahan, et.al. 1991) |
| Main references (sources) | - |
| Recommended books and references (scientific journals, reports...) | 1- 15th International Congress on Agricultural 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 |


 Asst. Prof. Yousef Youssef Hishah

 Head of the Scientific Committee
 Platform 10, SMI Amman Jordan


 Lecturer Mohamed Hishah




 Head of the Agricultural Machinery and Management Dept
 Asst. Prof. Yousef Youssef Hishah

Course Description Form

| | | |
|--|--|--|
| 1. Course Name: | | |
| Seminar | | |
| 2. Course Code: | | |
| SEM404 | | |
| 3. Semester / Year: | | |
| Second Course 2025–2026 | | |
| 4. Description Preparation Date: | | |
| 01–02–2026 | | |
| 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: Firas Salah Yahya Email: firas.alkhayatt@uomosul.edu.iq | | |
| 8. Course Objectives | | |
| Course Objectives for theory part | | |
| <ol style="list-style-type: none"> 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 | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Strategy of theory part</td> <td> <ul style="list-style-type: none"> - Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and - Conduct a seminar </td> </tr> </table> | Strategy of theory part | <ul style="list-style-type: none"> - Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and - Conduct a seminar |
| Strategy of theory part | <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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 |


 Director of Studies




 Head of Department

Course Description Form

| 1. Course Name: | | | | | |
|--|--------------------|--|---|--|---|
| English Language 4 | | | | | |
| 2. Course Code: | | | | | |
| ENGL 401 | | | | | |
| 3. Semester / Year: | | | | | |
| 2025/2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 01/02/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Presence + Online live meeting and Google classroom | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30 Hours / 2 Unit | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Omar AbdulHameed Al-Kurjia Email : omarkj @uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> studying the English language in special and scientific language Widening student mind about scientific and literature English vocabularies Helping the students to think and write in English | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Making use of the electronic available methods a like auditory or visual in addition to the white board plus google classroom | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2hours Presence | (A)The student should be able to know the basics of the English language | Practicing English with “ No Place like Home” + Reading out clearly and learning pronunciation + Vocabulary | Electronic lectures, videos, posters and other methods related to learning | Exams Reports Discussions quiz |
| 2 | 2hours Presence | (A)The student should be able to know the tenses of the English | Expat Tales : Ian Walker in Chile: Spoken English | Electronic lectures, videos, posters and other methods | Exams - Reports Discussions |

| | | | | | |
|----|-----------------|--|---|--|------------------------------------|
| | | language | informal Reading out, Listening, speaking, everyday English | related to learning | - quiz |
| 3 | 2hours Presence | (A)The student should be able to know the rules of the English language | Expat Tales 2 : Thomas Creed in Korea: Language + conversation with students | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 4 | 2hours Presence | (A)The student should be able to know the basics of the English language | Practicing English with “ The Blind Assassin” + Reading out clearly and learning pronunciation + Vocabulary | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 5 | 2hours Presence | (A)The student should be able to know the basics of the English language | Starting with Sheep” Dealing with English in Agriculture within different specialties (reading and pronunciation) | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 6 | 2hours Presence | (A)The student should be able to know the basics of the English language | Language Focus Part 1 English in Agriculture 2 : Homemade butter | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 7 | 2hours Presence | (A)The student should be able to know the basics of the English language | Conspiracy Theory 1 : The Death of Diana Reading out, Listening, speaking, | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 8 | 2hours Presence | (A)The student should be able to know the basics of the English language | Two Famous Brands : Starbucks Coffee Reading out, Listening, speaking, everyday English | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 9 | 2hours Presence | (A)The student should be able to know the basics of the English language | Conspiracy Theory 2 : The Apollo Moon Landings , Reading out, Listening, speaking, | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 10 | 2hours Presence | (A)The student should be able to | Conspiracy Theory 3 : The death of JFK | Electronic lectures, videos, posters and | Exams - Reports |

| | | | | | |
|----|-----------------|--|---|--|------------------------------------|
| | | know the basics of the English language | ., Reading out, Listening, speaking, everyday English | other methods related to learning | Discussions - quiz |
| 11 | 2hours Presence | (A)The student should be able to know the basics of the English language | Apple Macintosh Progressive interaction with students+ feedback+ | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 12 | 2hours Presence | (A)The student should be able to know the basics of the English language | The Kippers” Read, Digest and Analyze” | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 13 | 2hours Presence | (A)The student should be able to know the basics of the English language | The Coldest & Earliest places on Earth Reading out , Translation to Arabic , learning pronunciation | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 14 | 2hours Presence | (A)The student should be able to know the basics of the English language | F.R.I.E.N.D.S Past .Reading out , Translation to Arabic , learning pronunciation | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 15 | 2hours Presence | (A)The student should be able to know the basics of the English language | Jamie Oliver (The Worlds Greatest Chef) interaction with students+ feedback+ | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |

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 Methods | Evaluation Date (Week) | Marks | Relative Weight (%) |
|-------|-------------------------|--|-------------------|---------------------|
| 1 | Quiz (1) | Week 4 | Theoretical (5) | 5 |
| 2 | Monthly Exam (1) | Week 6 | Theoretical (15) | 15 |
| 3 | Quiz (2) | Week 8 | Theoretical (5) | 5 |
| 4 | Monthly Exam (2) | Week 13 | Theoretical (15) | 15 |
| 5 | Quest rate. | Seasonal rates are announced at the end of the semester. | Theoretical: (40) | 40 |
| 6 | Final Theoretical Test. | The Week Of Theoretical Exams. | 60 | 60 |
| Total | | | 100 | 100 |

12. Learning and Teaching Resources

| | |
|---|--|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | New Headway - English course Upper Intermediate 2020 |
| Recommended books and references (scientific) | New Headway - English course Upper Intermediate 2020 |

| | |
|---------------------------------|--|
| journals, reports...) | |
| Electronic References, Websites | <ul style="list-style-type: none"> • British Council – Upper-Intermediate (B2) https://learnenglish.britishcouncil.org/general-english/upper-intermediate-b2 (Grammar, vocabulary, listening, and reading exercises) • Perfect English Grammar https://www.perfect-english-grammar.com (Detailed grammar explanations and exercises) |


 Dr. Youssef Zakaria Hamed


 Head of Department
 Dr. Youssef Zakaria Hamed


 Head of the University
 Dr. Youssef Zakaria Hamed



Course Description Form

| 1. Course Name: | | | | | |
|--|---|--|-----------------------------|-------------------------------------|-------------------|
| Research Project 2 | | | | | |
| 2. Course Code: | | | | | |
| REPR403 | | | | | |
| 3. Semester / Year: | | | | | |
| Second semester (spring)/2025–2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Attendance + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30 practical hours / 1 units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghazwan Ahmed Dahham Email: ghazwanagr@uomosul.edu.iq Name: Ammar Wael Saleh Email: ammarwael1800@uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | <ol style="list-style-type: none"> 1. The student should be able to analyze data and prepare results for scientific project management. 2. The student should possess the ability to prioritize agricultural project investments and implement them correctly and successfully. 3. The student should have a scientific and economic understanding of establishing and investing in agricultural projects. | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | <ul style="list-style-type: none"> • Brainstorming • Dialogue and discussion • Assignment of tasks for data collection and review of previous studies • Students are assigned to prepare periodic reports according to the stages of project completion | | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 Practical | c1: The student chooses a subject for his research | Choose the research subject | Interactive lecture, brainstorming, | Reports |

| | | | | | |
|----|-------------|---|--|---|---------|
| | | | | dialogue and discussion | |
| 2 | 2 Practical | c4: The student proposes a plan for his research | Scientific research plan (research proposal) | Interactive lecture, dialogue and discussion | Reports |
| 3 | 2 Practical | b1: The student documents the data and information collected | Collect data and informations | Interactive lecture, dialogue and discussion | Reports |
| 4 | 2 Practical | b2: The student chooses the samples and research tools required | choose Samples and research tools | Interactive lecture, dialogue and discussion | Reports |
| 5 | 2 Practical | c2: The student writes his graduation research in his own style | Procedures for writing research project | Interactive lecture, dialogue and discussion | Reports |
| 6 | 2 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 | 2 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 | 2 Practical | c2: The student gives examples of previous studies for his research | Presenting previous studies | Interactive lecture, presentation of previous studies | Reports |
| 9 | 2 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 | 2 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 | 2 Practical | b3: The student tests the research data statistically | Analyze data statistically | Interactive lecture, reports and discussion | Reports |
| 12 | 2 Practical | b3: The student tabulates statistical data for research | Writing tables | Interactive lecture, reports and discussion | Reports |
| 13 | 2 Practical | a4: The student discusses his research data to derive useful tabular values | Results and conclusions | Interactive lecture, reports and discussion | Reports |
| 14 | 2 Practical | b3: The student adopts the results of his research | Recommendations | Interactive lecture, reports and discussion | Reports |
| 15 | 2 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. |



Course Description Form

| | | |
|--|--|--|
| 1. Course Name: | | |
| Forage Equipment | | |
| 2. Course Code: | | |
| FOEQ485 | | |
| 3. Semester / Year: | | |
| Spring / 2025-2026 | | |
| 4. Description Preparation Date: | | |
| 1 st Feb. 2026 | | |
| 5. Available Attendance Forms: | | |
| Attendance +electronic | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | |
| 60 hours (2 hours theorotucal +2 hours Practical) / 3 units | | |
| 7. Course administrator's name (mention all, if more than one name) | | |
| Name: Khalid E. Ahmed khalid.allaf@uomosul.edu.iq Mahmmod H. Rafiq mahmiud.h.r@uomosul.edu.iq | | |
| 8. Course Objectives | | |
| <p>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</p> <p>2- Enabling the student to know the types of this equipment and their uses in order to provide an optimum animal breeding environment</p> | | |
| 9. Teaching and Learning Strategies | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Strategy</td> <td>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</td> </tr> </table> | 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 |
| 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 | The importance of green fodder and harvesting methods | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |

| | | | | | |
|---|------------|---|---|--|------------------------------|
| | 2practical | Calibrate ,repair and maintained | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 2 | 2theorotic | Choosing suitable type of mower | Forage harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | Calibrate ,repair and maintained | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 3 | 2theorotic | enumerates the mechanisms used in drying and turning green fodder | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | Calibrate ,repair and maintained | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 4 | 2theorotic | Can distinguishes between types of baler | Baler making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, | Daily quiz and final examine |

| | | | | | |
|---|------------|--|--------------------------------------|--|------------------------------|
| | | | | and practical exercises | |
| | 2practical | 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 | 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 |
| | 2practical | 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 | the student understands the work of the silage harvester | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 7 | 2theorotic | the student understands the working mechanism of silage handling | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and | Daily quiz and final examine |

| | | | | | |
|----|------------|---|--------------------------------------|--|------------------------------|
| | | equipment (fixed type) | | discussion, field training, and practical exercises | |
| | 2practical | calibrate ,repair and maintained the equipment | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 8 | 2theorotic | the student enumerates the types of balers for making fodder | Baler making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | 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 |
| 9 | 2theorotic | C1the student learns about dray feed and the mechanism of operation of all types of grander | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 10 | 2theorotic | the student learns about feed mixer and | Dray forage making equipment | Interactive lecture, brainstorming | Daily quiz and final examine |

| | | | | | |
|----|------------|---|------------------------------|--|------------------------------|
| | | compressed feed and equipment | | g, dialogue and discussion, field training, and practical exercises | |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 11 | 2theorotic | the student enumerates the methods of handling feed inside cow barns | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 12 | 2theorotic | the student enumerates the methods of handling feed inside poultry barn | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 13 | 2theorotic | field visiting and | A field visit | Interactive | Report |

| | | | | | |
|----|------------|---|---------------|--|----------------|
| | | preparing report on feed machines making | | lecture, brainstorming, dialogue and discussion, field training, and practical exercises | prepare |
| | 2practical | 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 | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Report prepare |
| | 2practical | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Report prepare |
| 15 | 2theorotic | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Report prepare |
| | 2practical | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical | 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، لظفي حسين محمد وتوفيق فهمي دميان (1988) معدات مكننة الانتاج الحيواني، وزارة التعليم العالي والبحث العلمي، جامعة بغداد، العراق. |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |


 علي، لظفي حسين محمد
 توفيق فهمي دميان

 علي، لظفي حسين محمد
 توفيق فهمي دميان




 علي، لظفي حسين محمد
 توفيق فهمي دميان

 علي، لظفي حسين محمد
 توفيق فهمي دميان

Course Description Form

| |
|--|
| 1. Course Name: |
| Post Harvest Equipment |
| 2. Course Code: |
| POHE482 |
| 3. Semester / Year: |
| Second semester 2025-2026 |
| 4. Description Preparation Date: |
| 1/2/2026 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +30 practical hours =60hours / 3 Units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: prof. dr. Adel Ahmed Abdullah Email: dr.adil.aa@uomosul.edu.iq Ahmed Mohammad Ameen Saeed Email: ahmed_ameem@uomosul.edu.iq |
| 8. Course Objectives |
| <p>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.</p> <p>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.</p> <p>3 - The ability to improve post-harvest crop and food processing transactions</p> <p>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.</p> |
| 9. Teaching and Learning Strategies |
| <p>1-Interactive lecture</p> <p>2-Brainstorming</p> <p>3-Dialogue and discussion</p> <p>4-Field Training</p> <p>5-Practical exercises</p> <p>6-Field project</p> <p>7-Self-education</p> |

| 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 |
| | 2 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- | Short daily test1 |

| | | | | | |
|---|---------------|---|--|--|---|
| | | | | learning | Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 machines for agricultural crops | Cleaning techniques for agricultural crops | Interactive lecture, brainstorming, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 Practical | c3 the student conducts experiments on agricultural crop cleaning machines | Applications on regulations and standards for agricultural crop cleaning machines | Interactive lecture, brainstorming, dialog and discussion, field training, and self-learning | Short daily test1 Semester test1 Final test |
| 7 | 2 theoretical | a2 the student learns | Means of increasing the efficiency of | Interactive lecture, | Short |

| | | | | | |
|----|---------------|--|---|--|---|
| | | about means of increasing the efficiency of seed cleaning machines during sifting | seed cleaning machines during sifting | brainstorming, dialog and discussion, self-learning | daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 energy and color of grains | Grading machines based on electrical energy And the magnetism and color of the grains | Interactive lecture, brainstorming, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog and discussion, field training, and self-learning | Short daily test1 Semester test1 Final test |
| 12 | 2 theoretical | a2the student understands seed drying systems | Seed drying systems Using different types of dryers | Interactive lecture, brainstorming, dialog | Short daily |

| | | | | | |
|----|---------------|---|--|--|---|
| | | a5 it distinguishes the different types of seed dryers | | and discussion, self-learning | test1 Semester test1 Final test |
| | 2 Practical | c3 the student conducts experiments on laboratory seed drying machines | Laboratory applications and experiments on laboratory seed drying machines | Interactive lecture, brainstorming, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 agricultural products (all kinds of grains and fruits. a2 the student learns about vegetables) | Preserving and storing agricultural products (all kinds of grains, fruits and vegetables) | Interactive lecture, brainstorming, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 الرجيو ود. احمد صالح 2-هندسة تصنيع المنتجات الزراعية 1989 د. عبد الحميد زكريا ودمدحت 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 ابراهيم |
| Electronic References, Websites | https://www.youtube.com |



Course Description Form

| |
|--|
| 1. Course Name: |
| Plant Protection Equipment |
| 2. Course Code: |
| PLPE484 |
| 3. Semester / Year: |
| Second Semester (Spring) 2025-2026 / Fourth Stage |
| 4. Description Preparation Date: |
| 1-2-2026 |
| 5. Available Attendance Forms: |
| Combined (prison + online) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours (30 theoretical + 30 practical)/3 units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name of Lecturer for Theory part: Dr. Musaab Abdul Wahid Muhammad E-mail: goldenagr@uomosul.edu.iq Name of Lecturer for practical part: Mr. Othman Moayad Othman.mmt@uomosul.edu.iq |
| 8. Course Objectives |
| <ul style="list-style-type: none">- 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 |
| <ul style="list-style-type: none">- 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 | Artificial intelligence and machine learning techniques for data analysis and plant disease prediction c1/ Explains the role of protective equipment in the agricultural sector | The importance of using protective equipment and methods of applying it | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b1/ Identify methods of connecting and operating control equipment to the agricultural tractor and rotating in the field | Methods of connecting and operating control equipment to the agricultural tractor in the field | Assigning practical tasks | Discussions and short quiz |
| 2 | 2 | c2/ shows the classification of protective equipment | Classification of protective equipment | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b2/ Learn how to operate and adjust mechanical control equipment to control and eliminate bushes and pest colonies in the field or farm. | Mechanical control equipment | Assigning practical tasks | Discussions and short quiz |
| 3 | 2 | c3/ shows the sections of chemical control equipment | Types of chemical control equipment | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b3/ Learn how to operate and adjust soil preparation equipment and hoeing equipment to control and eliminate bushes | Mechanical control equipment before and during planting | Assigning practical tasks | Discussions and short quiz |
| 4 | 2 | b1/ Lists the sections and classifications of sprinklers | Classification of sprinklers | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b4/ Learn how to operate and adjust hoeing equipment between lines to combat jungles c1/ and calculate productivity | Mechanical control equipment in the presence of the growing crop | Assigning practical tasks | Discussions and short quiz |

| | | | | | |
|----|---|---|--|---|----------------------------|
| 5 | 2 | a1 / Explains the advantages and disadvantages of the control method | Advantages and disadvantages of the spray control method | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b5/ Learn how to properly operate chemical control and safety equipment while working in the field | Chemical control and safety considerations | Assigning practical tasks | Discussions and short quiz |
| 6 | 2 | a2 / Explains the requirements that must be met by sprinklers | Requirements that must be met in sprinklers | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b6/ Learn how to adjust and change chemical control equipment in the laboratory and field | Adjusting and calibrating chemical spraying equipment | Assigning practical tasks | Discussions and short quiz |
| 7 | 2 | c4 / Shows the most important parts of spray machines | The most important parts of spray machines | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b7/ Identify the components of chemical control equipment and the function of each part | The most important parts of spray equipment | Assigning practical tasks | Discussions and short quiz |
| 8 | 2 | a3 / Shows the most important parts of spray machines | Types of pumps used in sprinklers | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | c2/ Identify the productivity and spraying rate calculations before work and adjust the tractor speed based on those calculations | Calculate productivity and spray rate | Assigning practical tasks | Discussions and short quiz |
| 9 | 2 | a4 / Identify the types of ground sprinklers and their functions | Types of ground sprinklers and their functions | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b8/ Learn how to adjust the operation of the duster and maintain it after each spraying round | Maintenance and adjustment of fogging equipment | Assigning practical tasks | Discussions and short quiz |
| 10 | 2 | c5 / Explains the introduction to duster | Classification of dusters | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b9/ Identify the | The main parts that | Assigning | Discussions |

| | | | | | |
|----|---|--|--|--|----------------------------------|
| | | components of the duster and the function of each part | make up the dusters and their types | practical tasks | and short quiz |
| 11 | 2 | a5 Identify the types of ground dusters | Types of ground dusters and their functions | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b10/ Identify the components of fog diffusers and the function of each part | Fog diffusers | Assigning practical tasks | Discussions and short quiz |
| 12 | 2 | b2 / Identify the types of fogger and smokers | Types of foggers and smokers and their functions | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b11/ Practice operating the knapsack sprayer attached to the tractor in the field | Field training | Assigning tasks and reporting | Discussions and short quiz |
| 13 | 2 | a6 / Identifying spraying and air blowing equipment | Spraying and aerial fogging equipment | Audio styles, writing style, direct dialogue style | Discussion report and short test |
| | 2 | b12/ Identify ways to treat and dilute pesticides, safety when storing them, and cleaning and storing control equipment e1/ Preserving the environment from pesticide pollution | Maintenance and maintenance for the purpose of storage and safety during work | Assigning tasks and reporting | Discussions and short quiz |
| 14 | 2 | b3 / Identify the designs required in spraying aircraft | Necessary considerations for the design and operation of spraying and fogging aircraft | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b13/ A visit to the Nineveh Agriculture Directorate, Research Division | Scientific visit | Assigning tasks and reporting | Discussions and short quiz |
| 15 | 2 | c6 / Explains the types of mechanical control equipment | Types of mechanical control equipment (hoeing) | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b14/ Identify the types of devices and equipment that contribute to | Determine work paths and field location before and during air control | Assigning tasks and reporting | Discussions and short quiz |

| | | | | | |
|--|--|---|--|--|--|
| | | determining the location of spraying and directing control aircraft in the field. | | | |
|--|--|---|--|--|--|

| 11.Course evaluation | | | | |
|----------------------|-------------------------|------------------------|----------------|----------|
| No. | Evaluation methods | Evaluation date (week) | Grade Relative | weight % |
| 1 | Report 1 | Week 5 | 2.5 | 2.5 |
| 2 | Report 2 | Week 13 | 2.5 | 2.5 |
| 3 | Short test (1) Quiz | Week 3 | 2 | 2 |
| 4 | Short test (2) Quiz | Week 6 | 2 | 2 |
| 5 | Short test (3) Quiz | Week 12 | 1 | 1 |
| 6 | Semester test (1) | Week 6 | 7.5 | 7.5 |
| 7 | Semester test (2) | Week 7 | 7.5 | 7.5 |
| 8 | Final theoretical test | Final semester exams | 40 | 40 |
| 9 | Practical field project | Week 7 | 5 | 5 |
| 10 | Field evaluation | Weeks 13 | 2 | 2 |
| 11 | Final practical test | final semester exams | 20 | 20 |
| 12 | 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 | Food and Agriculture Organization (FAO) |



Course Description Form

| | | | | | |
|--|--------------|-----------------------------------|--|------------------------|--------------------------|
| 1. Course Name: | | | | | |
| Harvesting Equipment | | | | | |
| 2. Course Code: | | | | | |
| HAEQ481 | | | | | |
| 3. Semester / Year: | | | | | |
| The second spring semester/fourth stage/2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| in-person + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hours (2 theoretical + 4 practical / 4 units) | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Arkan Mohammad Amin Sedeeq | | | Email: arkanma.agri.col@uomosul.edu.iq | | |
| Name: Othman Muayad Mohammed Tofeq | | | othman.mmt@uomosul.edu.iq | | |
| 8. Course Objectives | | | | | |
| <ul style="list-style-type: none"> • 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 | | | | | |
| <ul style="list-style-type: none"> - 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 |
| | 4 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 |

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| | | related to the main and auxiliary parts of the grain harvester | | | |
| | 4 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 |
| | 4 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, |

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| | | <p>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</p> | equipment | dialogue and discussion, self-learning | final exam |
| 4 Practical | <p>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</p> | separating unit regulations | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Short practical test1 | |

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| 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 harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, self- learning | Semester exam 1, final exam |
| | 4 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 |

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| | 4 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 |
| | 4 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 |

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| | | each part. The student acquires knowledge and concepts related to equipment for harvesting fiber crops (sugarcane) | | | |
| | 4 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 |
| | 4 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 |

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| | | 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 |
| | 4 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 |

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| | | crops | | | |
| | 4 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 |
| | 4 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 |

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| | | 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 |
| | 4 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 |

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| | | beans. The student should be able to know the equipment for harvesting low-lying leguminous crops (peas). | | training, practical exercises, and self-learning | |
| | 4 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 |
| | 4 Practical | b16: Sustaining cotton harvesting | Sustaining fiber crop harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field | short exams, assignment of duty, discussions |

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

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

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Course Description – Thermodynamics

| 1. Course Name: | | | | | |
|---|------------|---|---|--|----------------------|
| Thermodynamics | | | | | |
| 2. Course Code: | | | | | |
| THER376 | | | | | |
| 3. Semester / Year: | | | | | |
| First semester/ Third Class / 2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1 / 9 / 2025 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Presence + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| Theory (2 hours)- practice (4 hours) (90 hours)/ 4 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 | | | | | |
| <ul style="list-style-type: none"> - Interactive lecture - Brainstorming - Dialogue and discussion - Practical exercises - Self-education | | | | | |
| 10. Course Structure | | | | | |
| We ek | 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, |
| | 4 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 |
| | 4 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 |

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| | | examples related to the topic | temperature and its types | discussion | |
| | 4 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, |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 its application on closed and open systems | Interactive lecture, brainstorming, dialogue and discussion | Exams, homework |
| | 4 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 its application on closed and open systems | Interactive lecture, brainstorming, dialogue and discussion | Exams, homework |
| | 4 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 |
| | 4 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 |
| | 4 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, |

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| | | understands and solves examples related to the topic | thermodynamics, entropy and thermal processes | brainstorming, dialogue and discussion | homework |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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

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| 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. Cengel & Michael A. Boles, 5 th 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 | ----- |



Course Description Form

| 1. Course Name: | | | | | |
|--|-------|----------------------------|---|-----------------|-------------------|
| Irrigation and drainage | | | | | |
| 2. Course Code: | | | | | |
| IRDR 308 | | | | | |
| 3. Semester / Year: | | | | | |
| First semester 2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1 \ 9 \ 2025 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Combined (Attendance + distance education) | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 2 theoretical + 2 practical/ 60/ 3 units/ | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Dr. Ahmed Khair El-Din Abdel Salam Email: ahmed.khairuldeen@uomosul.edu.iq M.M. Alia Abdel Latif Jassim Email: alyaaaltaee2@uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| <ul style="list-style-type: none"> - Enable the student to understand what is the science of irrigation and what is the irrigation process - Enabling the student to become familiar with classification of irrigation water - Enabling students to appreciate irrigation competencies - Enable the student to schedule irrigation and know water needs of the crop - Enabling the student to know the different irrigation methods - Enable the student to learn about the characteristics of sprinkler and drip irrigation | | | <p>practical:</p> <ul style="list-style-type: none"> - 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 water - He can estimate the tip - The student is able to estimate and calculate water consumption. - The student estimates the volume of water and drainage in the canals | | |
| 9. Teaching and Learning Strategies | | | | | |
| <p>theoretical:</p> <ul style="list-style-type: none"> - Interactive lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting | | | <p>practical:</p> <ul style="list-style-type: none"> - 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 Theoretical 2 practical | Theoretical:a1 What is the science of irrigation the irrigation process, and what are the sources 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 work to estimate some properties | Short exams, assignments, discussions |
| 2 | 2 Theoretical 2 practical | Theoretical: a2The student learns about rain-fed regions and what purposes irrigation achieves Practical: a9examples and applications of equivalent depth | Theoretical: Classification of rain-fed regions practical : Estimating the equivalent depth of soil water | Theoretical: The blackboard a style of dialog practical : Laboratory application reporting | Short exams, assignments, discussions |
| 3 | 2 Theoretical 2 practical | Theoretical: a3The student is familiar with the standards adopted in evaluating quality of irrigation water in terms of salinity, sodicity, and toxicity Practical b9Laboratory work estimate soil moisture content | Theoretical: Standards adopted in evaluating the quality of irrigation water practical : Estimating soil moisture conservation | Theoretical: Audio methods: writing on the blackboard practical : Assigning tasks and reporting | Short exams, assignments, discussions |
| 4 | 2 Theoretical 2 practical | Theoretical: a4The student will be able to estimate irrigation efficiencies (efficiency of transportation, irrigation, storage, and homogeneity) Practical:b10 The student can work on the pressure device | Theoretical Irrigation efficiencies Practical: pressure device | Theoretical: The solution method is on the board Practical Laboratory work and writing reports | Short exams, assignments, discussions |
| 5 | 2 Theoretical 2 practical | Theoretical: b1Applications and solutions of examples irrigation efficiencies and uniformity coefficient Practical: b11The student is able to estimate | Applications and examples of irrigation efficiencies Practical: Estimating field capacity and permanent wilting | Theoretical: Examples on the board practical : Make reports | Short exams, assignments, discussions |

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| | | calculate ready-made point water | | | |
| 6 | 2 Theoretical 2 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 irrigation and water needs Practical: water consumption | Theoretical: The blackboard a direct dialogue style practical : Assigning tasks and reports | exams, |
| 7 | 2 Theoretical 2 practical | Theoretical:b2 The student learns the stages of plant growth and the related curve, well as calculating the number of days between one irrigation and another Practical: b12The student can estimate evaporation using an evaporation basin | Theoretical: Plant growth stages irrigation frequency Practical: evaporation pan | Theoretical: Audio methods, writing style on blackboard practical : Assigning tasks and reporting | Short exams, assignments, discussions |
| 8 | 2 Theoretical 2 practical | Theoretical:a6 The student is able to learn about the different methods of irrigation and the ability to understand the advantages of surface irrigation Practical: b13The student is able to estimate water drainage | Theoretical: Different ways to apply water Practical: Methods of water measurements | Theoretical: Auditory method 'whiteboard method' Practical: field observations | Short exams, assignments, discussions |
| 9 | 2 Theoretical 2 practical | Theoretical:b3 The student is familiar with the irrigation method with its characteristics, and estimating the depth of irrigation using the irrigation method Practical: a11The student is able to estimate water drainage | Theoretical: Irrigation method Practical: Methods of measuring water - measuring facilities | Theoretical: Writing on the blackboard is a practical direct dialogue method Assigning tasks and reporting | Short exams, assignments, discussions |
| 10 | 2 Theoretical 2 practical | Theoretical:b4 The student is able to learn about the advantages of sprinkler irrigation as well as | Theoretical: Sprinkler irrigation | Theoretical: Audio methods, blackboard work: field | Short exams, assignments, discussions |

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| | | <p>devices</p> <p>Practical: a12The student will be able to estimate rain in the field or laboratory</p> | <p>Partical : the tip</p> | <p>laboratory work</p> | |
| 11 | 2 Theoretical 2 practical | <p>Theoretical:b5 The student is able to estimate the capacity of the sprinkler irrigation system, the capacity of one sprinkler</p> <p>Practical: b14Applying the infiltration basin</p> | <p>Theoretical: Sprinkler irrigation system capacity</p> <p>Practical: infiltration in the basin method</p> | <p>Theoretical: Writing on the blackboard is a practical direct dialogue method</p> <p>Assigning tasks and reporting</p> | <p>Short exams, assignments, discussions</p> |
| 12 | 2 Theoretical 2 practical | <p>Theoretical:b6 The student is able to identify the characteristics and determinants of drip irrigation, and estimate the coefficient of consistency</p> <p>Practical: a13The student is able to apply water consumption equations</p> | <p>Theoretical: Drip irrigation</p> <p>Practical: Water consumption experimental method</p> | <p>Theoretical: Chalkboard style</p> <p>practical : Applications in water consumption</p> | <p>Short exams, assignments, discussions</p> |
| 13 | 2 Theoretical 2 practical | <p>Theoretical:a7 The student is able to know the types of trocars, vertical trocars, and the characteristics of open trocars</p> <p>Practical: a14Mathematical applications about infiltration</p> | <p>Theoretical: Types of drain</p> <p>Practical: Estimate the Infiltration rate</p> | <p>Theoretical: Audio methods, blackboard</p> <p>Practical: Problems about calculating infiltration</p> | <p>Short exams, assignments, discussions</p> |
| 14 | 2 Theoretical 2 practical | <p>Theoretical:b7 The student learns about covered drain and what is the classification of drains according to the nature of their work</p> <p>Practical:a15 The student is able to identify what drainage</p> | <p>Theoretical: Covered drain</p> <p>Practical: drainage</p> | <p>Theoretical: The blackboard a direct dialogue style</p> <p>practical : Assigning tasks and reporting</p> | <p>exams</p> |
| 15 | 2 Theoretical 2 practical | <p>Theoreticalb8 By knowing the distance</p> | <p>Theoretical: Calculate the distance</p> | <p>Theoretical: Audio methods</p> | <p>Short exams, assignments,</p> |

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

11. Course Evaluation

| | Evaluation | Time of evaluation | 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 Food and Drug Administration. |

م.د. احمد خير الدين عبد السلام



احمد خير الدين عبد السلام

Course Description Form

| 1. Course Name: | | | | | |
|---|------------------|---|--|---|----------------------------------|
| Sowing and fertilizing equipment | | | | | |
| 2. Course Code: | | | | | |
| SOFE378 | | | | | |
| 3. Semester / Year: | | | | | |
| First semester (autumn)/2025–2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/9/2025 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Combined (Attendance + distance education) | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 60 hours (30 theoretical hours + 30 practical hours) / 3 units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Yousif Yakoub Hilal | | Email: yousif.yakoub @uomosul.edu.iq | | | |
| Mahmood natiq | | Email: manatiq9 @uomosul.edu.iq | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> - Graduating agricultural engineers and researchers to serve the agricultural sector. - Scientific cooperation with agricultural directorates and other parties with the aim of improving agricultural production in quantity and quality. - Investing in modern technology in the field of 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |



Course Description Form-Soil Preparation Equipment

| |
|--|
| 1. Course Name: |
| Soil Preparation Equipment |
| 2. Course Code: |
| SOPE377 |
| 3. Semester / Year: |
| first semester 2025-2026 |
| 4. Description Preparation Date: |
| 1/9/2025 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +30 practical hours =60 hours \ 3 Units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: prof. dr. Adel Ahmed Abdullah Email: dr.adil.aa@uomosul.edu.iq Ahmed Mohammad Ameen Saeed Email: ahmed_ameem@uomosul.edu.iq |
| 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 |
| | 2Practical | 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 |
| | 2 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 |
| | 2 Practical | c3 trials and tests a disc | Applications, | Interactive lecture, | Short daily test1 |

| | | | | | |
|----|---------------|---|--|--|---|
| | | plow in the field c2write a report on the disc plow | regulations, and field experiments on the disc plow | brainstorming, dialogue and discussion, field training, and self-learning | 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 |
| | 2 Practical | c3 tries and tests a vertical disc plow in the field c2write a report on the vertical disc plow | Applications, regulations,and field experiments on the Vertical disc plow | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | Short daily test1 Semester test1 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 Practical | c3 tries and tests the plow or the sub-cutting hoe in the field c2 writes a report on the plow or the undercut hoe | Applications, regulations,and field experiments on subsoiler shear joints | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | Short daily test1 Semester test1 Final test |
| 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 |
| | 2 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: Identifying the operation Rollers and graders and Land and land-leveling machines using laser technology | Rollers and graders and Land-Leveling Machines – Application of Operational Mechanisms Using | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Short daily test1 Semester test1 Final test |

| | | | | | |
|----|---------------|---|---|--|---|
| | | based on artificial intelligence and GPS for agricultural fields. a5: Distinguishes their type a5 distinguishes its types | Artificial Intelligence | | |
| | 2 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 |
| | 2 Practical | c3 tries and tests plotting machines in the field c2 writes 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 |
| | 2 Practical | c3 experiments and tests the mechanical assembly of soil preparation machines in the field c2 write a report on the mechanical assembly of soil preparation machines | Applications, regulations, and field experiments on mechanical assembly machines | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | Short daily test1 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 |
| | 2 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 |
| | 2 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 | The importance of | Interactive lecture, | Short daily test1 |

| | | | | | |
|---|-----------|---|--|--|---|
| | | of maintaining and maintaining soil preparation equipment | maintenance and maintenance - storing soil preparation machines | brainstorming, dialogue and discussion, self-learning | Semester test1 Final test |
| 2 | 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) | Tillage equipment |
| Main references (sources) | FARM MACHINERY AND EQUIPMENT |
| Recommended books and references (scientific journals, reports...) | ELEMENTS of Agricultural Machinery |
| Electronic References, Websites | https://www.youtube.com |



Course Description Form

| | |
|---|--|
| 1. Course Name: | |
| Animal Production Mechanization | |
| 2. Course Code: | |
| ANPM224 | |
| 3. Semester / Year: | |
| First Semester Autumn 2025-2026 | |
| 4. Description Preparation Date: | |
| 1/9/2025 | |
| 5. Available Attendance Forms: | |
| Physical & Electronic | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 hours of theory and 4 hours of practical, for 15 weeks, making a total of 90 hours / 4 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 Email: Othman.mmt@uomosul.edu.iq | |
| 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 |

| | |
|--------------------------------|--|
| | <ul style="list-style-type: none"> - Assigning tasks and reporting - Displaying real models of orchard mechanization equipment and machines |
| Strategy practical part | <ul style="list-style-type: none"> - 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 |
| | 4 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 | a1: Identify harmful gases in the barn a1: 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 |
| | 4 practical | b1: Examination the 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 | a1: Identify the idea of the cooling system a1: Identify the mechanisms for cooling the barn atmosphere | Controlling environmental conditions in barns (cooling) | Interactive lecture, brainstorming, dialogue and discussion, self-learning | quiz |
| | 4 practical | b1: Examination the operating and maintaining cooling systems c1: Discover 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 | a1: Identify the concept of heating a1: 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 |
| | 4 practical | b1: Examination the operating and maintaining heating systems | Operating and maintaining heating systems | Interactive lecture, brainstorming, dialogue and | Assign an assignment and a short test |

| | | | | | |
|---|---------------|--|---|--|---------------------------------------|
| | | b1: Examination temperatures in the barn | | discussion, field training, and self-learning | |
| 5 | 2 Theoretical | a1: 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 |
| | 4 practical | b1: Practice operating the water pumping station on the farm b1: 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 | a1: 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 |
| | 4 practical | c1: Discover 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 | a1: Identifying the types of feeders according to the types of breeding systems or animal pens, and understanding the working principle of dry feed and silage feeding mechanisms. | Feeders and feed presenting equipment | Interactive lecture, brainstorming, dialogue and discussion, self-learning | quiz |
| | 4 practical | b1: Training to operate feed presenting equipment b1: Discover the 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 | a1: 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 |
| | 4 practical | b1: 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 | a1: Identify the concept of shearing wool and | Mechanization of wool shearing | Interactive lecture, | Semester test And a short test |

| | | | | | |
|----|---------------|---|--|--|--|
| | | Identify the types of wool shearing machines | | brainstorming, dialogue and discussion, self-learning | |
| | 4 practical | b1: Examination the 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 | a1: 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 |
| | 4 practical | b1: 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 | a1: Identify the types of milking systems and milking halls | Milking systems and milking halls | Interactive lecture, brainstorming, dialogue and discussion, self-learning | quiz |
| | 4 practical | b1: Examination the 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 | a1: 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 |
| | 4 practical | b1: Examination the 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 | a1: 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 |
| | 4 practical | b1: Examination the operating and maintaining egg transport and handling equipment | Operating and maintaining table egg transport and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field | Assignment of a report discussions assignment and a short test |

| | | | | | |
|----|---------------|--|--|--|---------------------------------------|
| | | | | training, and self-learning | |
| 14 | 2 Theoretical | a1: 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 |
| | 4 practical | b1: Practice operating animal island equipment b1: Examination the 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 | a2: Acquaint about equipment for cooling and preserving animal products | Cooling and preserving animal products | Interactive lecture, brainstorming, dialogue and discussion, self-learning | quiz |
| | 4 practical | b1: Examination the 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 |



Course Description Form

| |
|--|
| 1. Course Name: |
| Fluid Mechanics |
| 2. Course Code: |
| FLME79 |
| 3. Semester / Year: |
| first semester 2025–2026 |
| 4. Description Preparation Date: |
| 1/9/2025 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +60 practical hours =90 hours / 4 Units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq Gazwan Ahmed Dahham Email: ghazwanagr@uomosul.edu.iq |
| 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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- | 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 | test1 Final test |
| | 4 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 | 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 test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |

| | | | | | |
|----|---------------|--|---|--|---|
| | | | | discussion, self-learning | |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | 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 | 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 test2 test1 Final test |
| | 4 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 | Semester test1 Final test |

| | | | | | |
|----|---------------|---|--|--|---------------------|
| | | of friction and marginal roughness | | and discussion, field training, and self-learning | |
| 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, brainstorming, dialogue and discussion, self-learning | test1 Final test |
| | 4 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, brainstorming, dialogue and discussion, field training, and self-learning | test1 Final test |
| 12 | 2 theoretical | a1 the student knows the laws for equivalent pipe and tank emptying | Flow in a pipeline | Interactive lecture, brainstorming, dialogue and discussion, self-learning | test1 Final test |
| | 4 Practical | c4the student conducts experiments a3 solves mathematical problems about flow in a pipeline | Flow in a pipeline | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | 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, brainstorming, dialogue and discussion, self-learning | test1 Final test |
| | 4 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, brainstorming, dialogue and discussion, field training, and self-learning | test1 Final test |
| 14 | 2 theoretical | a2 the student understands | Performance of centrifugal | Interactive | test1 |

| | | | | | |
|----|---------------|---|--|--|--|
| | | everything related to the performance and operation of centrifugal pumps | pumps | lecture, brainstorming, dialogue and discussion, self-learning | Final test |
| | 4 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 | 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 test3 test1 Final test |
| | 4 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 | Semester test1 Final test |

11. Course Evaluation

| Seq. | Evaluating style | date | marks | Relative weight |
|------|------------------------|-------------------|-------|-----------------|
| 1 | Home reports | Every5 weeks | 10 | 10% |
| 2 | Short tests | every 5weeks | 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 للنشر 1977 |
| 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 |



Course Description Form

| | |
|--|--|
| 1. Course Name: | |
| Agricultural Buildings | |
| 2. Course Code: | |
| AGBU480 | |
| 3. Semester / Year: | |
| Autum/2025-2026 | |
| 4. Description Preparation Date: | |
| 1 st Sep. 2025 | |
| 5. Available Attendance Forms: | |
| Attendance + electronic | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 60 hours (2hours theoretical +2 hours practical) / 3 units | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Khalid E. Ahmed Email: khalid.allaf@uomosul.edu.iq Ammar Wael Saleh Email: ammarwael1800@uomosul.edu.iq | |
| 8. Course Objectives | |
| <p>The learner should be able to define the concept of buildings and the information that must be available for their optimal design</p> <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> -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 | A6,B1 the student learns about agricultural buildings | introduction to agricultural buildings | the audio-visual method uses the date show | quiz and midterm exam |
| | 2practical | A9 the student uses building distribution 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 | A6,C1 the student learns the basics of constructing agricultural buildings | basics of building construction | the audio-visual method uses the date show | quiz and midterm exam |
| | 2practical | A32 the student uses building distribution methods | distribution of buildings according to wind direction | the audio-visual method uses the date show | quiz and midterm exam |
| 3 | 2 theoretical | B32 the student learns about the types of thermal insulation | thermal insulation | the audio-visual method uses the date sho | quiz and midterm exam |
| | 2practical | B1 the student learns to use | thermal insulation | the audio-visual method uses the date show | quiz and midterm exam |

| | | | | | |
|---|---------------|---|--------------------------------------|---|-----------------------------|
| | | isolation | | | |
| 4 | 2 theoretical | A13,B32 the student proposes a building plan | construction plan | the audio- visual method uses the date show | quiz and midterm exam |
| | 2practical | B39, the student learns about the building plan | construction plan | the audio- visual method uses the date show | quiz and midterm exam |
| 5 | 2 theoretical | A32, the student enumerates the types of barns | types of barns | | quiz and midterm exam |
| | 2practical | B32, 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 | B32,C23, the student recognizes the type of barn | barns with cubic | the audio- visual method uses the date show | quiz and midterm exam |
| | 2practical | B32 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 | A35,B39 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 |
| | 2practical | C24, the student | dimensions of barns with | the audio- visual method | quiz and midterm |

| | | | | | |
|----|---------------|---|--|--|-----------------------|
| | | controls the dimensions of the bed according to the type | cubic | uses the date show | exam |
| 8 | 2 theoretical | B32, 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 |
| | 2 practical | C24, 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 | A35, the student identifies the type of barn | multi-section barns | the audio-visual method uses the date show | quiz and midterm exam |
| | 2 practical | C24, 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 | A35, the student identifies the components of the barn | cow barns with stalls | the audio-visual method uses the date show | quiz and midterm exam |
| | 2 practical | B32 the student mentions | cow barns with stalls | the audio-visual method uses the | quiz and midterm exam |

| | | | | | |
|----|---------------|--|------------------------------|--|-----------------------|
| | | the components of the barn | | date show | |
| 11 | 2 theoretical | A35, the student knows the components of a barn | sheep pens | the audio-visual method uses the date show | quiz and midterm exam |
| | 2 practical | B32, the student plans the barn | sheep pens | the audio-visual method uses the date show | quiz and midterm exam |
| 12 | 2 theoretical | B32 the student is familiar with the methods of constructing protected buildings | Smart green house | the audio-visual method uses the date show | quiz and midterm exam |
| | 2 practical | B32 the student chooses the layout of the greenhouse | Using Arduion in green house | the audio-visual method uses the date show | quiz and midterm exam |
| 13 | 2 theoretical | B32, the student understands treatment methods | waste management in farm | the audio-visual method uses the date show | quiz and midterm exam |
| | 2 practical | B32, the student plans treatment methods | waste management in farm | the audio-visual method uses the date show | quiz and midterm exam |
| 14 | 2 theoretical | B32 the student masters waste disposal methods | waste management in farm | the audio-visual method uses the date show | quiz and midterm exam |

| | | | | | |
|----|---------------|--|--------------------------|--|-----------------------|
| | 2practical | B32 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 | B32, the student prepares a report | a field visit | the audio-visual method | seminar |
| | 2practical | B32, the student prepares a repor | A field visit | The audio-visual method | Seminar |

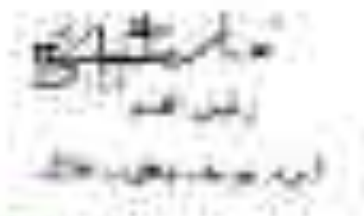
1. Course Evaluation

| 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 Bulbing Design House Agricultural Waste Management Systems Free Stall Design Housing Design For Cattle |

| | |
|---|--|
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |



Course Description Form

| | |
|--|---|
| 1. Course Name: | |
| Computer applications4 | |
| 2. Course Code: | |
| COMA403 | |
| 3. Semester / Year: | |
| Autumn semester / 2025–2026 | |
| 4. Description Preparation Date: | |
| 1/9/2025 | |
| 5. Available Attendance Forms: | |
| Blended learning (Attendance + Electronic) | |
| 6. Number of Credit Hours (Total) / Number of Units (Total): | |
| 2 hours/2 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 | <ul style="list-style-type: none"> • 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 | <ol style="list-style-type: none"> 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 | 2 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 | 2 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 | 2 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 | 2 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 | 2 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 | 2 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 | <ul style="list-style-type: none"> - 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 | 2 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 | 2 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. | <ul style="list-style-type: none"> - 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 | 2 | 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 | 2 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 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 | 2 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 | 2 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 | 2 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 | 2 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 | 2 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) | | <ul style="list-style-type: none"> - 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/ | | |



Course Description Form For Maintenance and Repair of Tractors

| 1. Course Name: | | | | | |
|---|---|---|--|---------------------------------|-------------------|
| Maintenance and Repair of Tractors | | | | | |
| 2. Course Code: | | | | | |
| MART475 | | | | | |
| 3. Semester / Year: | | | | | |
| 1 st semester (4 th class) 2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1 – 9 – 2025 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Physical & Electronic | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hr (2-4 hours) / 15 weeks (4) units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Assistant Prof. Dr. Montaser Khairie Hussain Email: montaser.hussain@uomosul.edu.iq | | | Assistant Lecturer. Ammar Wael Saleh ammarwael1800@uomosul.edu.iq | | |
| 8. Course Objectives | | | | | |
| Course Objectives | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | 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 |
| | 4 | Conduct a workshop training session on using personal protective equipment and safety procedures. | | | |

| | | | | | |
|---|--------------------------|---|--|--|------------------------------|
| | | used in food processing industry. | | dialogue style | |
| | 2 (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 |
| | 2 (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 |
| | 2 (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 |
| | 2 (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 freezing equipment. | Refrigeration and freezing | Auditory methods Writing style Direct dialogue style | Midterm exam 2 Final exam |
| | 2 (Practical approach) | b12 The student learns about the types | Refrigeration and freezing equipment | Assignments, Reports | Homework |

| | | | | | |
|----|--------------------------|---|--|--|--|
| | | of refrigeration and freezing equipment in food processing industry, as well as the associated calculations. | | | |
| 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 |
| | 2 (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 |
| | 2 (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 |
| | 2 (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 mechanism of materials handling. | Materials handling | Auditory methods Writing style Direct dialogue | Midterm exam 2 Final exam |

| | | | | | |
|----|--------------------------|---|---|--|--|
| | | | | style | |
| | 2 (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 |
| | 2 (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 |
| | 2 (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 |
| | 2 (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 |
| | 2 (Practical approach) | a16 The student becomes familiar with the packaging devices used in a food | | Assignments, Reports | Industrial report |

processing industry.

11. Course Evaluation

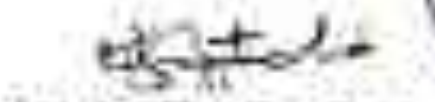
| Seq. | Evaluating style | Date | marks | Relative weight |
|------|---------------------------------------|--|------------------------------|-----------------|
| 1 | Final report: theoretical + practical | Theoretical: Week 13 Practical: week 13 | 7 theoretical + 6 practical | %13 |
| 2 | Monthly test 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) | |
| 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 | |


د. امر حميد الداهان
مدير وحدة التعليم


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Course Description Form

| |
|--|
| 1. Course Name: |
| Hydraulic System and Equipments |
| 2. Course Code: |
| HYSE477 |
| 3. Semester / Year: |
| first semester 2025–2026 |
| 4. Description Preparation Date: |
| 1/9/2025 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +60 practical hours =90 hours / 4 Units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Arkan Mohammad Amin Sedeeq Email: arkanma.agri.col@uomosul.edu.iq Nan Mahmood natiq Email: manatiq9@uomosul.edu.iq |
| 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 Practical | c3 apply and experiment with what you have learned about hydraulic motors | Practical applications and experiments on Hydraulic motors | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | Short daily test1 Semester test1 Final test |

| | | | | | |
|----|---------------|--|---|--|---|
| 5 | 2 theoretical | a2 understands what hydraulic pumps are a2 defines the types, parts, and mechanism of action | Definition and classification of hydraulic pumps and the use of modern mechanical technologies (Types_parts_mechanism of action) | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 4 Practical | c3 apply and experiment with what you have learned about hydraulic pumps | Practical applications and experiments on Hydraulic pumps and the use of modern mechanical technologies | 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 | |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 Practical | C3 Applies and experiments with what he has learned | Practical applications and experiments on maintaining an | Interactive lecture, brainstorming, | Short daily test1 Semester test1 |

| | | | | |
|--|---|--------------------------------|--|------------|
| | about maintaining and maintaining hydraulic equipment | sustaining hydraulic equipment | dialogue and discussion, field training, and self-learning | 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) | <p>1- أسس تصميم وصيانة النظم الهيدروليكية . محمد شيخو معمور. شعاع للنشر والعلوم 2009</p> <p>2- أسس الآلات الهيدروليكية (تقنية آلات زراعية) . المؤسسة العامة للتعليم الفني والتدريب المهني</p> <p>3- هيدروليكية المكنان الزراعية. عبد الجبار خلف الجميلي وعبد العزيز عباس عزيز 1992</p> <p>4- التحكم الهيدروليكي وتطبيقاته . أحمد عبد المتعال . دار النشر للجامعات 1997</p> |
| Recommended books and references (scientific journals, reports...) | <p>1- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007, 2st Addition, SAK Publisher , Press in 2007</p> <p>2- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007, 1st Addition, SAK Publisher , Press in 2007</p> <p>3- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007, 2st Addition, SAK Publisher , Press in 2007</p> <p>4- Hydraulic Basics - technique of Agricultural Equipments, General Institution for technical training, 2007, 1st Addition, SAK Publisher , Press in 2007</p> |
| Electronic References, Websites | https://www.youtube.com |


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 جامعة القاهرة


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- 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 |
| | 4 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 |
| | 4 Practical | e3/Applications Mathematical | Mathematical applications 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 Practical | e3/Applications Mathematical | Mathematical applications about the script | Reports | quiz homework discussions |
| 11 | 2 Theoretical | b2/Machines for digging irrigation and digging channels | Identifying machines for digging irrigation and drain channels, the forces affecting them, and calculating their productivity | Auditory methods Writing style Direct dialogue style | quiz homework discussions |
| | 4 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 productivity | Auditory methods Writing style Direct dialogue style | quiz homework discussions |
| | 4 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 |
| | 4 Practical | e3/Applications Mathematical | Mathematical applications about hydraulic digging | Reports | quiz homework discussions |

| | | | | | |
|----|---------------|------------------------------------|--|--|---------------------------------|
| | | | machines | | |
| 14 | 2 Theoretical | c3/Identify of clam shell | Identify of clam shells, the forces affecting them, and calculate their productivity | Auditory methods Writing style Direct dialogue style | quiz homework discussions |
| | 4 Practical | e3/Applications Mathematical | Mathematical applications about clam shell | Reports | quiz homework discussion |
| 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 |
| | 4 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 | |



Course Description Form

| | |
|---|---|
| 1. Course Name: | Design of Agricultural Machinery |
| 2. Course Code: | DAMA383 |
| 3. Semester / Year: | Second Semester 2025–2026 |
| 4. Description Preparation Date: | 1/2/2026 |
| 5. Available Attendance Forms: | Attendance + Online |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | 90 hours /4 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 | <ul style="list-style-type: none">- 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 | <ol style="list-style-type: none">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 | |

| Theory | | | | | |
|--------|---------------------------|--|---|---|----------------------|
| Week | Hours/ lecture type | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2/ Theoretic al | 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 |
| 2 | 2/ Theoretic al | 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 | 2/ Theoretic al | 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 |
| 4 | 2 / Theoretic al | 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 |
| 5 | 2/ Theoretic al | 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 |
| 6 | 2 / Theoretic al | 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 |
| 7 | 2 / Theoretic al | 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 |
| 8 | 2 / Theoretic al | 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 |

| | | | | | |
|----|------------------------|--|--|---|--------------------|
| 9 | 2 / Theoretic al | 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 |
| 10 | 2 / Theoretic al | 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 |
| 11 | 2 / Theoretic al | 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 |
| 12 | 2 / Theoretic al | 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 |
| 13 | 2 / Theoretic al | 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 |
| 14 | 2 / Theoretic al | 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 |
| 15 | 2 / Theoretic al | b2: getting to know twist moment diagrams on rotating axes | applying schemes Twist moments on the axis's rotary | Discussion, self- learning | Quiz discussion |

Experimental

| Week | Hours/ lecture type | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|---------------------------|-------------------------------|---|---|----------------------|
| 1 | 4/ Practical | : a11 solving problems | Practical: Solving stress issues and emotion | Interactive lecture, brainstorming, dialogue and discussion, self- earning | Quiz |
| 2 | 4 / Practical | a12 : solving problems | Solving stress issues And emotion | Interactive lecture, brainstorming, dialogue and discussion, self- earning | Quiz |
| 3 | 4/ Practical | a13: solving problems | Solving stress issues and emotion | Interactive lecture, brainstorming, dialogue and discussion, self- learning | Quiz discussion |
| 4 | 4 / | a14: examinations that | Conducting | Interactive lecture, | Quiz |

| | | | | | |
|----|---------------|--|---|--|-----------------|
| | Practical | run on materials and metals before use | examinations Laboratory (shock and hardness) | brainstorming, dialogue and discussion, self-learning | discussion |
| 5 | 4 / Practical | a15: Conduct an experiment | Conducting shock, shock and hardness experiments practically | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 6 | 4 / 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 | 4 / Practical | b4: solving problems | solving Load problems spreader | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 8 | 4 / Practical | b5: solving problems | Solving power problems Shear and Bending moments | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 9 | 4 / Practical | a16: solve examples | Practical: solving Shear force problems Bending moments for inclined loads | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Quiz discussion |
| 10 | 4 / 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 | 4 / 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 | 4 / Practical | a18: more clarification Thresholds used in Designs T and I | solving theoretical problems Simple bending | Interactive lecture, brainstorming | Quiz discussion |
| 13 | 4 / Practical | a19: solve Examples rotating parts | solving theoretical problems Simple contortions | Interactive lecture, brainstorming, dialogue | Quiz discussion |
| 14 | 4 / Practical | b7: solve examples | solving theoretical problems minor sprains | Discussion, self-learning | Quiz discussion |
| 15 | 4 / 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 |



[Signature]
 Dr. Sabah Muhammad Jameel Ali
 Associate Professor
 Department of Agricultural Equipment and Technology
 College of Agriculture and Forestry
 University of Mosul, Iraq

[Signature]
 Dr. Sabah Muhammad Jameel Ali
 Associate Professor
 Department of Agricultural Equipment and Technology
 College of Agriculture and Forestry
 University of Mosul, Iraq

Course Description Form

| 1. Course Name: | | | | | | |
|--|------------------------|---|--|----------------------------|---|-------------------|
| Design and Analysis of Agricultural Experiment | | | | | | |
| 2. Course Code: | | | | | | |
| DAAE302 | | | | | | |
| 3. Semester / Year: | | | | | | |
| 2025 – 2026 Second Semester (Spring). | | | | | | |
| 4. Description Preparation Date: | | | | | | |
| 1 / 2 / 2026 | | | | | | |
| 5. Available Attendance Forms: | | | | | | |
| Attendance + electronic | | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | | |
| 60 hours (2 theoretical, 2 practical) / 3 units | | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | | |
| Name: Ahmed Majeed Abdulaah / Dhafr Abdul Razak Farhan Email: ahmed3079@uomosul.edu.iq / Dhufir.Al-Najmawi@uomosul.edu.iq | | | | | | |
| 8. Course Objectives | | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> 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 | | <ul style="list-style-type: none"> - 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 | Recalls statistical symbols and measures of mediation and dispersion | General statistical review | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | b5 | Performs a general statistical review | General statistical review | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |

| | | | | | |
|----|------------------------|---|---|---|----------------------|
| 2 | Theoretical (2) | b1 Shows the concept of experimental design and some definitions related to the design and analysis of experiments | definitions Full random design, complete random sectors, and Latin square | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | a3 Recalls the types of designs used in agricultural experiments | Types of designs used in agricultural experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 3 | Theoretical (2) | c1 Demonstrates what a complete random design is | Complete Randomized Design (CRD) | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | b6 the complete random design CRD | Complete Randomized Design (CRD) | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 4 | Theoretical (2) | c2 shows the equation of the mathematical model and estimates the components of the mathematical variance | Equation of the mathematical model and estimation of its components | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | c6 the components of variance | Variance Components | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| 5 | Theoretical (2) | d1 Demonstrates the advantages and disadvantages of designing complete random Blocks | Randomized Complete Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | c7 Shows what is the design of complete random blocks RCBD | Randomized Complete Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| 6 | Theoretical (2) | d2 Organizes and analyzes a table of statistical data | of contrast components – missing observations – Relative efficiency of design | Interactive lecture and brainstorming, dialogue, and discussion | 1 st Exam |
| | Practical (2) | b7 Identifies methods of data collection and analysis statistically | Variation Components – Estimating Missing Observation Values – Estimating the Relative Efficiency of Design | Interactive lecture and brainstorming, dialogue, and discussion | 1 st Exam |
| 7 | Theoretical (2) | b2 Enumerates the advantages and disadvantages of the Latin square | Latin Square Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| | Practical (2) | b8 Shows what is the design of the Latin LSD box | LSD Latin Square Design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 8 | Theoretical (2) | a2 Explains how to use the three designs 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 (2) | c8 Visits the research station of the field crops department to learn about the designs used in agricultural experiments | 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 Distinguish between methods of testing averages | of comparisons between averages of transactions | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | d5 Uses methods of testing and comparing averages | of testing and comparing averages | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Homework |
| 10 | Theoretical (2) | d3 Shows what factorial experiments are and when to use | efficiency and lost viewing of LSD design | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Report |
| | Practical (2) | c9 the first part of factor experiments | first part of factorial experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 11 | Theoretical (2) | b3 Explains factor experiments and what is the concept of interaction between factors | first part of factorial experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz Report |
| | Practical (2) | d6 The second part of the factor experiments shows | second part of factorial experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 12 | Theoretical (2) | c4 Determines how data is collected and tabulated for the purpose of | second part of factorial experiments | Interactive lecture and brainstorming, dialogue, and | Quiz |

| | | | | | |
|----|------------------------|--|--|---|----------------------|
| | | statistical analysis | | discussion | |
| | Practical (2) | b9 Suggests a method for collecting and analyzing data statistically | collection and analysis statistically | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 13 | Theoretical (2) | b4 Demonstrates the importance of interference in factorial experiments | Interaction in factor experiments | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| | Practical (2) | a4 Recognizes the overlap between factors through a table of analysis of variance and graph | Interaction between factors through Anova table and graph | Interactive lecture and brainstorming, dialogue, and discussion | Quiz |
| 14 | Theoretical (2) | c5 Determines when to use splinter plate system factor experiments | Split-plot Experiments | Interactive lecture and brainstorming, dialogue, and discussion | 2 nd Exam |
| | Practical (2) | a5 experiments with splinter plate system | Split-plot Experiments | Interactive lecture and brainstorming, dialogue, and discussion | 2 nd Exam |
| 15 | Theoretical (2) | d4 Organizes a report on how to take measurements of traits | How to take measurements of traits and put them in tables | Interactive lecture and brainstorming, dialogue, and discussion | Write a report |
| | Practical (2) | b10 Writes a report on how measurements of traits are taken in the field and placed in tables | How to take measurements of traits in the field and put them in tables | Interactive lecture and brainstorming, dialogue, and discussion | Write a report |

11. Course Evaluation

| No. | Evaluation Methods | Evaluation (week) | Date | Degrees | Relative weight |
|-----|-------------------------------|-------------------------|------|---------|-----------------|
| 1 | A report 1 | fourth week | | 2.5 | 2.5 |
| 2 | A report 2 | fifth week | | 2.5 | 2.5 |
| 3 | Short test (1) Quiz | sixth week | | 2 | 2 |
| 4 | Short test (2) Quiz | The fourteenth week | | 2 | 2 |
| 5 | Short test (3) | The fifteenth week | | 1 | 1 |
| 6 | semester test (1) | sixth week | | 7.5 | 7.5 |
| 7 | semester test (2) | eleventh week | | 7.5 | 7.5 |
| 8 | Final theoretical test | Final theoretical exam | | 40 | 40 |
| 9 | Practical field project | The fifteenth week | | 5 | 5 |
| 10 | Laboratory evaluation | third and fifth week | | 2 | 2 |
| 11 | Practical short test (1) Quiz | First week | | 1 | 1 |
| 12 | Practical short test (2) Quiz | fourth week | | 0.5 | 0.5 |
| 13 | Practical short test (3) Quiz | The fourteenth week | | 1 | 1 |
| 14 | Live drawings and homework | 6,8,9,10,11,12,13 weeks | | 5.5 | 5.5 |
| 15 | Final practical test | Final practical exam | | 20 | 20 |
| | 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 |



| | | | | | |
|----|------------|---|---|--|-----------------|
| | | | illustrated pictures, and laboratory models | discussion, self-learning | |
| 4 | 2 Theory | a1,a2: Remembers and understands the topic | Basic concepts of reciprocating engines | Interactive lecture, brainstorming, dialogue and discussion | Exams, |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 |
| | 2 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 | Engine cycles (Diesel and dual cycle) | Interactive lecture, brainstorming, dialogue and discussion | Exams, homework |
| | 2 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 |
| | 2 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 |
| | 2 Practice | a2,a3: Understands and solves problems related | Solve problems related to the topic | Interactive lecture, brainstorming, dialogue and | Exams, homework |

| | | | | | |
|----|------------|---|---|--|-----------------|
| | | to the topic | | discussion, self-learning | |
| 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 |
| | 2 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 |
| | 2 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, |
| | 2 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, 2 nd ed., John Wiley and Sons, 2001 |
| Recommended books and references (scientific journals, reports...) | ----- |
| Electronic References, Websites | ----- |



Course Description Form

| |
|--|
| 1. Course Name: |
| Orchard Machinery and Crop service |
| 2. Course Code: |
| OMCS 381 |
| 3. Semester / Year: |
| Second Semester (Spring) 2025-2026 |
| 4. Description Preparation Date: |
| 1-2-2026 |
| 5. Available Attendance Forms: |
| blended learning (Physical + Electronic) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 2 hours of theory and 2 hours of practical, for 15 weeks, making a total of 60 hours / 3 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 Email: ammarwael1800@uomosul.edu.iq |
| 8. Course Objectives |
| Course Objectives for theory part |
| <ul style="list-style-type: none">- 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 |
| <ul style="list-style-type: none">- 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 | <ul style="list-style-type: none"> - Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting - Displaying real models of orchard mechanization equipment and machines |
| Strategy of practical part | <ul style="list-style-type: none"> - 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 | <p>a1, a2: The student identifies and learns about the requirements for choosing a land site to establish an orchard</p> <p>e1: Encourages spreading awareness about the importance of plant cover and the sustainability of orchards</p> | Principles of choosing a land location and establishing the orchard | Dialogue and writing style on smart board | Discussions and short quiz |
| 2 | 2 | <p>a1: The student learns about the types of tractors for orchards</p> <p>c1: The student determines the specifications of orchard tractors</p> | Orchard tractors and their specifications | Dialogue and writing style on smart board | Discussions and short quiz |
| 3 | 2 | <p>a4: The student learns what reclamation equipment is?</p> <p>c3: Choosing the most appropriate method for each</p> | Equipment for land reclamation in small and large orchards | Dialogue and writing style on smart board | Discussions and short quiz |

| | | | | | |
|---|---|---|---|---|----------------------------|
| | | land preparation process | | | |
| 4 | 2 | a1: The student learns what soil preparation equipment is? c3: Choose the most suitable soil preparation | Soil preparation equipment for orchards | Dialogue and writing style on smart board | Discussions and short quiz |
| 5 | 2 | a1: The student learns about the principle of making plants and seedlings c1: 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 | a1: The student learns the principle of working of excavators for planting seedlings c1: 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 | a1: The student learns about fertilization processes and the concept of sprinkler or drip irrigation c2: 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 | a1: The student learns about the working principle of pest control machines c1: Explain how it can be used to extinguish fires | Pest control and Aerial fire control | Dialogue and writing style on smart board | Discussions and short quiz |
| 9 | 2 | a1: The student learns about the principle of | Branch pruning and trimming equipment | Dialogue and writing style on smart board | Discussions and short quiz |

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|----|---|---|---|---|----------------------------------|
| | | operation of pruning and trimming machines c1: Explain how to choose the most appropriate machine | | | |
| 10 | 2 | a1: The student learns about the concept of cutting c1: Determine tree fall calculations | Equipment for cutting logs | Dialogue and writing style on smart board | Discussions and short quiz |
| 11 | 2 | a1: The student learns the concept of transportation c1: 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 | a1: The student learns the principle of operation of tree uprooting and stump processing machines c1: 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 | a1, c2: 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 dialogue and discussion | Discussion report and short test |
| 14 | 2 | a1: The student learns about the concept of the work of vegetable harvesters c3: 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 | a1: The student learns about the | Fruit harvesting equipment | Dialogue and writing style on | Discussions and short quiz |

| | | | | | |
|-----------------------|--------------|--|---|---------------------------|----------------------------|
| | | concept of the work of fruit harvesters c3: Shows how to calculate productivity | | smart board | |
| Practical part | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning meth | Evaluation meth |
| 1 | 2 | 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 practical tasks | Discussions and short quiz |
| 2 | 2 | b2: The student applies the processes of leveling and amending orchard land with appropriate equipment | Calibration and maintenance of Orchard land Reclamation equipment | Assigning practical tasks | Discussions and short quiz |
| 3 | 2 | b3: Gains experience in attaching, operating and organizing plows | Calibration and maintenance Primary tillage equipment | Assigning practical tasks | Discussions and short quiz |
| 4 | 2 | b4: Gain experience in connecting, operating and organizing smoothing equipment | Calibration and maintenance Secondary tillage equipment | Assigning practical tasks | Discussions and short quiz |
| 5 | 2 | b4: The student applies the process of operating and organizing seeds and seedlings | Calibration and maintenance of Seeds and seedlings | Assigning practical tasks | Discussions and short quiz |
| 6 | 2 | b4: Gain experience in connecting and operating core excavators | Organizing and maintaining Drilling equipment | Assigning practical tasks | Discussions and short quiz |
| 7 | 2 | b4: Gains experience in operating and organizing | Organizing and maintaining Fertilization and Irrigation | Assigning practical tasks | Discussions and short quiz |

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| | | fertilization and irrigation equipment | equipment | | |
| 8 | 2 | b4: Gains experience in connecting, operating and organizing control machines c1: Calculates the spray rate of the sprinkler | Calibration and maintenance of Pest and Aerial fire control | Assigning practical tasks | Discussions and short quiz |
| 9 | 2 | b4: Gains experience in attaching, operating and organizing pruning and trimming equipment | Organize pruning and trimming equipment | Assigning practical tasks | Discussions and short quiz |
| 10 | 2 | b4: Gain experience in connecting, operating and organizing equipment for cutting and dropping tree trunks | Organizing and maintaining cutting equipment | Assigning practical tasks | Discussions and short quiz |
| 11 | 2 | b4: Gains experience in attaching, operating and organizing log processing and transport equipment | Organizing and maintaining transport equipment | Assigning practical tasks | Discussions and short quiz |
| 12 | 2 | b4: 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 practical tasks | Discussions and short quiz |
| 13 | 2 | b4: 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 dialogue and discussion | Discussion of the report and a short test |
| 14 | 2 | b4: Gains experience in | Organizing and maintaining | Assigning practical tasks | Discussions and short quiz |


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| | | connecting, operating and organizing vegetable harvesters | vegetable harvesting equipment | | |
| 15 | 2 | b4: Gains experience in attaching, operating and organizing fruit harvesters | Organizing and maintaining fruit harvesting equipment | Assigning practical tasks | Discussions and short quiz |

11. Course Evaluation

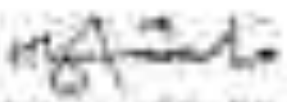
| Theoretical evaluation method | | evaluation date | evaluation degree |
|-------------------------------|---|-----------------|-------------------|
| 1- | Monthly test | Week 9 | 10 % |
| 2- | Quiz | Weeks 1-15 | 10 % |
| 3- | Report | Week 13 | 5 % |
| total | | | 25 % |
| Practical evaluation method | | 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

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| 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. Morteza Anvari M.A. Ph.D.


Teacher of Practical Part
Mr. Abbas


Chairman of the Scientific Committee
Professor Dr. Yousef Yekani


Head of Agricultural Mechanization
Department
Mr. Dr. Amir



Course Description Form

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|---|
| 1. Course Name: |
| Irrigation and Drainage Equipment |
| 2. Course Code: |
| IRDE382 |
| 3. Semester / Year: |
| Second semester 2025–2026 |
| 4. Description Preparation Date: |
| 1/2/2026 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +60 practical hours =90 hours / 4 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 mahmoud.h.r@uomosul.edu.iq |
| 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 |
|------|-------|----------------------------|----------------------|-----------------|-------------------|
|------|-------|----------------------------|----------------------|-----------------|-------------------|

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|---|---------------|--|--|--|------------------------------|
| 1 | 2 theoretical | A2 The student learns about the types and types of irrigation pumps A2 Understands 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 | Semester test1 Final test |
| | 4 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 | test1 Final test |
| 2 | 2 theoretical | A2 The 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | test1 Final test |
| 4 | 2 theoretical | A2 The student learns about turbine and submersible pumps A2 and classifies its types C1 and enumerates its features and parts | Turbo and submersible pumps, their types, advantages, disadvantages, and parts | Interactive lecture, brainstorming, dialogue and discussion, self-learning | test1 Final test |
| | 4 Practical | B3 The student applies the | Installing and operating | Interactive lecture, | test1 |

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| | | 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 | pumps Turbine and submersible turbines, their maintenance and maintenance | brainstorming, dialogue and discussion, field training, and self-learning | 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 test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 coefficient. | Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning | test1 Final test |
| 8 | 2 theoretical | A2 The student learns about | Irrigation by artillery | Interactive lecture, | test1 |

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|----|---------------|---|--|--|--|
| | | the artillery sprinkler irrigation system A2 and its types are classified C1 and enumerates its features and parts | sprinkler, its types and parts Its features and methods of installation and operation | brainstorming, dialogue and discussion, self-learning | Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 test2 test1 Final test |
| | 4 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 | test1 Final test |
| 11 | 2 theoretical | A2 The student learns about the circular (pivot) sprinkler irrigation system. A2 and its types are | Circularly moving sprinkler irrigation (pivotal), its types, parts, features and methods | Interactive lecture, brainstorming, dialogue and discussion, self- | test1 Final test |

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|----|---------------|---|---|--|---------------------|
| | | classified C1 and enumerates its features and parts | Install it and run it | learning | |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |
| | 4 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 | 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 | test1 Final test |

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| | 4 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 | 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 test3 test1 Final test |
| | 4 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 | Semester test1 Final test |

1. Course Evaluation

| Seq. | Evaluating style | date | marks | Relative weight |
|------|------------------------|-------------------|-------|-----------------|
| 1 | Home reports | every 5 weeks | 10 | 10% |
| 2 | Short tests | every 5 weeks | 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) | <p>1- المضخات الزراعية . المؤسسة العامة للتعليم الفني والتدريب المهني 2005</p> <p>2- الري بالرش الأجهزة والتطبيقات – ملفين كاي 2000</p> <p>3- تقانات الري الحديثة . د.عصام خضير الحديثي وآخرون 2010</p> <p>4- هندسة المضخات , محمود ربيع الملط 2000</p> <p>5- هندسة الري , محسن حسين نواردة و حسن محمد حسيني</p> |
| Recommended books and references (scientific journals, reports...) | <p>1- الري اساسياته وتطبيقاته – د. نبيل ابراهيم – عصام خضير 1990</p> <p>2- الري الزراعي – د. بدر جاسم علاوي – محمد حسن عزوز 198</p> <p>3- هندسة مياه الري . د.فاضل محمد ظاهر 2021</p> <p>4- معدات الري واليزل . د.عبدالرزاق عبداللطيف و د.شذى ماجد نفاوة 2017</p> <p>5- Irrigation Systems Engineering , Dr. A. Y. HACHEM & H. Ismaail ,st Addition, Dar Alhikma Publisher, Mosul Univ. Press, 1992</p> |
| Electronic References, Websites | https://www.youtube.com |



Course Description Form

| 1. Course Name: | | | | | |
|--|------------------|--|--|--|-------------------------------|
| Mechanics of tractors performance | | | | | |
| 2. Course Code: | | | | | |
| METP380 | | | | | |
| 3. Semester / Year: | | | | | |
| Second semester (spring)/2025–2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Combined (Attendance + distance education) | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hours (30 theoretical hours + 60 practical hours) / 4 units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Assis. Professor Mothana Abedalmalik Noori Email: moth1973@uomosul.edu.iq Name: Asst. Lecturer. Ammar Wael Saleh Email: ammarwael1800@uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> – Graduating agricultural engineers and researchers to serve the agricultural sector. – Scientific cooperation with 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, | Reports, Quizzes, Discussions |

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|---|------------------|--|--|---|-------------------------------|
| | | | | smart boards | |
| | 4 Practical | c1: Solve mathematical examples of the forces acting on the tractor while standing and moving | Applications and mathematical problems on the forces affecting the tractor at rest and in motion. | Interactive lecture, dialogue and discussion, field training and practical | Reports, Quizzes, Discussions |
| 2 | 2 Theoretical | a2: Explains and clarifies through lectures | Soil strength – ultimate traction force. | attendance lectures using display devices: data shows, smart boards | Reports, Quizzes, Discussions |
| | 4 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 |
| | 4 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. Fuel consumption – Specific fuel consumption | Interactive lecture, dialogue and discussion, field training and practical | Reports, Quizzes, Discussions |
| | 4 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 As well as with regard to fuel consumption and specific fuel consumption | Interactive lecture, dialogue and discussion, field training and practical As well as regarding fuel consumption and specific fuel consumption | 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 |
| | 4 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 |
| | 4 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 | a7: Explains and clarifies | Methods used to | attendance | Reports, |

| | | | | | |
|----|---------------|---|---|--|-------------------------------|
| | Theoretical | through lectures | determine the location of the center of gravity of the tractor (suspension - balancing - weight). | lectures using display devices: data shows, smart boards | Quizzes, Discussions |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 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 |
| | 4 Practical | c10: Apply mathematical examples from the | reports, quizzes, discussions | Interactive lecture, dialogue and | Reports, Quizzes, |

| | | | | | |
|----|---------------|---|--|--|-------------------------------|
| | | previous topics | | discussion, field training and practical | Discussions |
| 14 | 2 Theoretical | a14: Explains and clarifies through lectures | Mechanism of operation of the differential system - types of final reduction systems+ Hydraulic system. | attendance lectures using display devices: data shows, smart boards | Reports, Quizzes, Discussions |
| | 4 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 |
| | 4 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 |


د. هاني الفاييز
رئيس قسم اللغة العربية


د. هاني الفاييز
رئيس قسم اللغة العربية




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د. هاني الفاييز
رئيس قسم اللغة العربية

Course Description Form

| | | |
|--|--|--|
| 1. Course Name: | | |
| Seminar | | |
| 2. Course Code: | | |
| SEM404 | | |
| 3. Semester / Year: | | |
| Second Course 2025–2026 | | |
| 4. Description Preparation Date: | | |
| 01–02–2026 | | |
| 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: Firas Salah Yahya Email: firas.alkhayatt@uomosul.edu.iq | | |
| 8. Course Objectives | | |
| Course Objectives for theory part | | |
| <ol style="list-style-type: none"> 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 | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Strategy of theory part</td> <td> <ul style="list-style-type: none"> - Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and - Conduct a seminar </td> </tr> </table> | Strategy of theory part | <ul style="list-style-type: none"> - Effective lectures - Brainstorming - Dialogue and discussion - Assigning tasks and - Conduct a seminar |
| Strategy of theory part | <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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 |



Course Description Form For Management of Agricultural Machineries

| 1. Course Name: | | | | | |
|---|--|---|--|---|--------------------|
| Management of Agricultural Machineries | | | | | |
| 2. Course Code: | | | | | |
| MAAM483 | | | | | |
| 3. Semester / Year: | | | | | |
| 2 nd semester (4 th class) 2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1 – 2 – 2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Attendance + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hr (2-4 hours) / 15 weeks (4) units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Yousif Yakoub Hilal Email: yousif.yakoub @uomosul.edu.iq Mahmood natiq Email: manatiq9 @uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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) |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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 |
| | 4 | 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) |
| | 4 | 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) |
| | 4 | 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 |


 Asst. Prof. Yousef Youssef Al-Tahan

 Faculty of Agricultural Engineering
 University of Al-Qadisiyah

 Head of the Agricultural Machinery and Equipment Department
 Asst. Prof. Yousef Youssef Al-Tahan


 Asst. Prof. Yousef Youssef Al-Tahan


Course Description Form

| | | | | | |
|--|--------------------|---|---|--|---|
| 1. Course Name: | | | | | |
| English Language 4 | | | | | |
| 2. Course Code: | | | | | |
| ENGL 401 | | | | | |
| 3. Semester / Year: | | | | | |
| 2025/2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 01/02/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Presence + Online live meeting and Google classroom | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30 Hours / 2 Unit | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Omar AbdulHameed Al-Kurjia Email : omarkj @uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | <ul style="list-style-type: none"> • studying the English language in special and scientific language • Widening student mind about scientific and literature English vocabularies • Helping the students to think and write in English | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Making use of the electronic available methods a like auditory or visual in addition to the white board plus google classroom | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2hours Presence | (A)The student should be able to know the basics of the English language | Practicing English with “ No Place like Home” + Reading out clearly and learning pronunciation + Vocabulary | Electronic lectures, videos, posters and other methods related to learning | Exams Reports Discussions quiz |
| 2 | 2hours Presence | (A)The student should be able to know the tenses of the English | Expat Tales : Ian Walker in Chile: Spoken English | Electronic lectures, videos, posters and other methods | Exams - Reports Discussions |

| | | | | | |
|----|-----------------|--|---|--|------------------------------------|
| | | language | informal Reading out, Listening, speaking, everyday English | related to learning | - quiz |
| 3 | 2hours Presence | (A)The student should be able to know the rules of the English language | Expat Tales 2 : Thomas Creed in Korea: Language + conversation with students | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 4 | 2hours Presence | (A)The student should be able to know the basics of the English language | Practicing English with “ The Blind Assassin” + Reading out clearly and learning pronunciation + Vocabulary | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 5 | 2hours Presence | (A)The student should be able to know the basics of the English language | Starting with Sheep” Dealing with English in Agriculture within different specialties (reading and pronunciation) | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 6 | 2hours Presence | (A)The student should be able to know the basics of the English language | Language Focus Part 1 English in Agriculture 2 : Homemade butter | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 7 | 2hours Presence | (A)The student should be able to know the basics of the English language | Conspiracy Theory 1 : The Death of Diana Reading out, Listening, speaking, | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 8 | 2hours Presence | (A)The student should be able to know the basics of the English language | Two Famous Brands : Starbucks Coffee Reading out, Listening, speaking, everyday English | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 9 | 2hours Presence | (A)The student should be able to know the basics of the English language | Conspiracy Theory 2 : The Apollo Moon Landings , Reading out, Listening, speaking, | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 10 | 2hours Presence | (A)The student should be able to | Conspiracy Theory 3 : The death of JFK | Electronic lectures, videos, posters and | Exams - Reports |

| | | | | | |
|----|-----------------|--|---|--|------------------------------------|
| | | know the basics of the English language | ., Reading out, Listening, speaking, everyday English | other methods related to learning | Discussions - quiz |
| 11 | 2hours Presence | (A)The student should be able to know the basics of the English language | Apple Macintosh Progressive interaction with students+ feedback+ | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 12 | 2hours Presence | (A)The student should be able to know the basics of the English language | The Kippers” Read, Digest and Analyze” | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 13 | 2hours Presence | (A)The student should be able to know the basics of the English language | The Coldest & Earliest places on Earth Reading out , Translation to Arabic , learning pronunciation | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 14 | 2hours Presence | (A)The student should be able to know the basics of the English language | F.R.I.E.N.D.S Past .Reading out , Translation to Arabic , learning pronunciation | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |
| 15 | 2hours Presence | (A)The student should be able to know the basics of the English language | Jamie Oliver (The Worlds Greatest Chef) interaction with students+ feedback+ | Electronic lectures, videos, posters and other methods related to learning | Exams - Reports Discussions - quiz |

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 Methods | Evaluation Date (Week) | Marks | Relative Weight (%) |
|-------|-------------------------|--|-------------------|---------------------|
| 1 | Quiz (1) | Week 4 | Theoretical (5) | 5 |
| 2 | Monthly Exam (1) | Week 6 | Theoretical (15) | 15 |
| 3 | Quiz (2) | Week 8 | Theoretical (5) | 5 |
| 4 | Monthly Exam (2) | Week 13 | Theoretical (15) | 15 |
| 5 | Quest rate. | Seasonal rates are announced at the end of the semester. | Theoretical: (40) | 40 |
| 6 | Final Theoretical Test. | The Week Of Theoretical Exams. | 60 | 60 |
| Total | | | 100 | 100 |

12. Learning and Teaching Resources

| | |
|---|--|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | New Headway - English course Upper Intermediate 2020 |
| Recommended books and references (scientific) | New Headway - English course Upper Intermediate 2020 |

| | |
|---------------------------------|--|
| journals, reports...) | |
| Electronic References, Websites | <ul style="list-style-type: none"> • British Council – Upper-Intermediate (B2) https://learnenglish.britishcouncil.org/general-english/upper-intermediate-b2 (Grammar, vocabulary, listening, and reading exercises) • Perfect English Grammar https://www.perfect-english-grammar.com (Detailed grammar explanations and exercises) |


 A.C. Ghannouchi


 Dr. Youssef Jabane


 Prof. Dr. Abdelhak



Course Description Form

| 1. Course Name: | | | | | |
|--|---|--|-----------------------------|-------------------------------------|-------------------|
| Research Project 2 | | | | | |
| 2. Course Code: | | | | | |
| REPR403 | | | | | |
| 3. Semester / Year: | | | | | |
| Second semester (spring)/2025–2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Attendance + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30 practical hours / 1 units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghazwan Ahmed Dahham Email: ghazwanagr@uomosul.edu.iq Name: Ammar Wael Saleh Email: ammarwael1800@uomosul.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | <ol style="list-style-type: none"> 1. The student should be able to analyze data and prepare results for scientific project management. 2. The student should possess the ability to prioritize agricultural project investments and implement them correctly and successfully. 3. The student should have a scientific and economic understanding of establishing and investing in agricultural projects. | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | <ul style="list-style-type: none"> • Brainstorming • Dialogue and discussion • Assignment of tasks for data collection and review of previous studies • Students are assigned to prepare periodic reports according to the stages of project completion | | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 Practical | c1: The student chooses a subject for his research | Choose the research subject | Interactive lecture, brainstorming, | Reports |

| | | | | | |
|----|-------------|---|--|---|---------|
| | | | | dialogue and discussion | |
| 2 | 2 Practical | c4: The student proposes a plan for his research | Scientific research plan (research proposal) | Interactive lecture, dialogue and discussion | Reports |
| 3 | 2 Practical | b1: The student documents the data and information collected | Collect data and informations | Interactive lecture, dialogue and discussion | Reports |
| 4 | 2 Practical | b2: The student chooses the samples and research tools required | choose Samples and research tools | Interactive lecture, dialogue and discussion | Reports |
| 5 | 2 Practical | c2: The student writes his graduation research in his own style | Procedures for writing research project | Interactive lecture, dialogue and discussion | Reports |
| 6 | 2 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 | 2 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 | 2 Practical | c2: The student gives examples of previous studies for his research | Presenting previous studies | Interactive lecture, presentation of previous studies | Reports |
| 9 | 2 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 | 2 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 | 2 Practical | b3: The student tests the research data statistically | Analyze data statistically | Interactive lecture, reports and discussion | Reports |
| 12 | 2 Practical | b3: The student tabulates statistical data for research | Writing tables | Interactive lecture, reports and discussion | Reports |
| 13 | 2 Practical | a4: The student discusses his research data to derive useful tabular values | Results and conclusions | Interactive lecture, reports and discussion | Reports |
| 14 | 2 Practical | b3: The student adopts the results of his research | Recommendations | Interactive lecture, reports and discussion | Reports |
| 15 | 2 Practical | b1: The student presents the sources used in the research | Writing sources | Interactive lecture, reports and discussion | Reports |

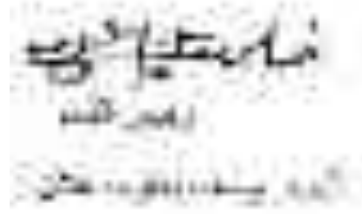
1. Course Evaluation

| 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. |



Course Description Form

| | | |
|--|--|--|
| 1. Course Name: | | |
| Forage Equipment | | |
| 2. Course Code: | | |
| FOEQ485 | | |
| 3. Semester / Year: | | |
| Spring / 2025-2026 | | |
| 4. Description Preparation Date: | | |
| 1 st Feb. 2026 | | |
| 5. Available Attendance Forms: | | |
| Attendance +electronic | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | |
| 60 hours (2 hours theorotucal +2 hours Practical) / 3 units | | |
| 7. Course administrator's name (mention all, if more than one name) | | |
| Name: Khalid E. Ahmed khalid.allaf@uomosul.edu.iq Mahmmod H. Rafiq mahmiud.h.r@uomosul.edu.iq | | |
| 8. Course Objectives | | |
| <p>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</p> <p>2- Enabling the student to know the types of this equipment and their uses in order to provide an optimum animal breeding environment</p> | | |
| 9. Teaching and Learning Strategies | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Strategy</td> <td>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</td> </tr> </table> | 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 |
| 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 | Evaluatio n method |
|------|------------|---|---|--|------------------------------|
| 1 | 2theorotic | The importance of green fodder and harvesting methods | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |

| | | | | | |
|---|------------|---|---|--|------------------------------|
| | 2practical | Calibrate ,repair and maintained | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 2 | 2theorotic | Choosing suitable type of mower | Forage harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | Calibrate ,repair and maintained | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 3 | 2theorotic | enumerates the mechanisms used in drying and turning green fodder | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | Calibrate ,repair and maintained | Forage prepare and harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 4 | 2theorotic | Can distinguishes between types of baler | Baler making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, | Daily quiz and final examine |

| | | | | | |
|---|------------|--|--------------------------------------|--|------------------------------|
| | | | | and practical exercises | |
| | 2practical | 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 | 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 |
| | 2practical | 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 | the student understands the work of the silage harvester | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 7 | 2theorotic | the student understands the working mechanism of silage handling | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and | Daily quiz and final examine |

| | | | | | |
|----|------------|---|--------------------------------------|--|------------------------------|
| | | equipment (fixed type) | | discussion, field training, and practical exercises | |
| | 2practical | calibrate ,repair and maintained the equipment | Silage making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 8 | 2theorotic | the student enumerates the types of balers for making fodder | Baler making and handling equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | 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 |
| 9 | 2theorotic | C1the student learns about dray feed and the mechanism of operation of all types of grander | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 10 | 2theorotic | the student learns about feed mixer and | Dray forage making equipment | Interactive lecture, brainstorming | Daily quiz and final examine |

| | | | | | |
|----|------------|---|------------------------------|--|------------------------------|
| | | compressed feed and equipment | | g, dialogue and discussion, field training, and practical exercises | |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 11 | 2theorotic | the student enumerates the methods of handling feed inside cow barns | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 12 | 2theorotic | the student enumerates the methods of handling feed inside poultry barn | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| | 2practical | calibrate ,repair and maintained the equipment | Dray forage making equipment | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Daily quiz and final examine |
| 13 | 2theorotic | field visiting and | A field visit | Interactive | Report |

| | | | | | |
|----|------------|---|---------------|--|----------------|
| | | preparing report on feed machines making | | lecture, brainstorming, dialogue and discussion, field training, and practical exercises | prepare |
| | 2practical | 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 | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Report prepare |
| | 2practical | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Report prepare |
| 15 | 2theorotic | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical exercises | Report prepare |
| | 2practical | student report seminar | A field visit | Interactive lecture, brainstorming, dialogue and discussion, field training, and practical | 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، لطف حسين محمد وتوفيق فهمي دميان (1988) معدات مكننة الانتاج الحيواني، وزارة التعليم العالي والبحث العلمي، جامعة بغداد، العراق. |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

جامعة بغداد
 كلية الزراعة
 ا.م.د. محمد هادي



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Course Description Form

| |
|--|
| 1. Course Name: |
| Post Harvest Equipment |
| 2. Course Code: |
| POHE482 |
| 3. Semester / Year: |
| Second semester 2025-2026 |
| 4. Description Preparation Date: |
| 1/2/2026 |
| 5. Available Attendance Forms: |
| Combined (Attendance + distance education) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 theoretical hours +30 practical hours =60hours / 3 Units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: prof. dr. Adel Ahmed Abdullah Email: dr.adil.aa@uomosul.edu.iq Ahmed Mohammad Ameen Saeed Email: ahmed_ameem@uomosul.edu.iq |
| 8. Course Objectives |
| <p>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.</p> <p>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.</p> <p>3 - The ability to improve post-harvest crop and food processing transactions</p> <p>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.</p> |
| 9. Teaching and Learning Strategies |
| <p>1-Interactive lecture</p> <p>2-Brainstorming</p> <p>3-Dialogue and discussion</p> <p>4-Field Training</p> <p>5-Practical exercises</p> <p>6-Field project</p> <p>7-Self-education</p> |

| 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 |
| | 2 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- | Short daily test1 |

| | | | | | |
|---|---------------|---|--|--|---|
| | | | | learning | Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 machines for agricultural crops | Cleaning techniques for agricultural crops | Interactive lecture, brainstorming, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 Practical | c3 the student conducts experiments on agricultural crop cleaning machines | Applications on regulations and standards for agricultural crop cleaning machines | Interactive lecture, brainstorming, dialog and discussion, field training, and self-learning | Short daily test1 Semester test1 Final test |
| 7 | 2 theoretical | a2 the student learns | Means of increasing the efficiency of | Interactive lecture, | Short |

| | | | | | |
|----|---------------|--|---|--|---|
| | | about means of increasing the efficiency of seed cleaning machines during sifting | seed cleaning machines during sifting | brainstorming, dialog and discussion, self-learning | daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 energy and color of grains | Grading machines based on electrical energy And the magnetism and color of the grains | Interactive lecture, brainstorming, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog and discussion, field training, and self-learning | Short daily test1 Semester test1 Final test |
| 12 | 2 theoretical | a2the student understands seed drying systems | Seed drying systems Using different types of dryers | Interactive lecture, brainstorming, dialog | Short daily |

| | | | | | |
|----|---------------|---|--|--|---|
| | | a5 it distinguishes the different types of seed dryers | | and discussion, self-learning | test1 Semester test1 Final test |
| | 2 Practical | c3 the student conducts experiments on laboratory seed drying machines | Laboratory applications and experiments on laboratory seed drying machines | Interactive lecture, brainstorming, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 agricultural products (all kinds of grains and fruits. a2 the student learns about vegetables) | Preserving and storing agricultural products (all kinds of grains, fruits and vegetables) | Interactive lecture, brainstorming, dialog and discussion, self-learning | Short daily test1 Semester test1 Final test |
| | 2 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, dialog 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 الرجيو ود. احمد صالح 2-هندسة تصنيع المنتجات الزراعية 1989 د. عبد الحميد زكريا ودمدحت 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 ابراهيم |
| Electronic References, Websites | https://www.youtube.com |



Course Description Form

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|--|
| 1. Course Name: |
| Plant Protection Equipment |
| 2. Course Code: |
| PLPE484 |
| 3. Semester / Year: |
| Second Semester (Spring) 2025-2026 / Fourth Stage |
| 4. Description Preparation Date: |
| 1-2-2026 |
| 5. Available Attendance Forms: |
| Combined (prison + online) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours (30 theoretical + 30 practical)/3 units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name of Lecturer for Theory part: Dr. Musaab Abdul Wahid Muhammad E-mail: goldenagr@uomosul.edu.iq Name of Lecturer for practical part: Mr. Othman Moayad Othman.mmt@uomosul.edu.iq |
| 8. Course Objectives |
| <ul style="list-style-type: none">- 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 |
| <ul style="list-style-type: none">- 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 | Artificial intelligence and machine learning techniques for data analysis and plant disease prediction c1/ Explains the role of protective equipment in the agricultural sector | The importance of using protective equipment and methods of applying it | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b1/ Identify methods of connecting and operating control equipment to the agricultural tractor and rotating in the field | Methods of connecting and operating control equipment to the agricultural tractor in the field | Assigning practical tasks | Discussions and short quiz |
| 2 | 2 | c2/ shows the classification of protective equipment | Classification of protective equipment | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b2/ Learn how to operate and adjust mechanical control equipment to control and eliminate bushes and pest colonies in the field or farm. | Mechanical control equipment | Assigning practical tasks | Discussions and short quiz |
| 3 | 2 | c3/ shows the sections of chemical control equipment | Types of chemical control equipment | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b3/ Learn how to operate and adjust soil preparation equipment and hoeing equipment to control and eliminate bushes | Mechanical control equipment before and during planting | Assigning practical tasks | Discussions and short quiz |
| 4 | 2 | b1/ Lists the sections and classifications of sprinklers | Classification of sprinklers | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b4/ Learn how to operate and adjust hoeing equipment between lines to combat jungles c1/ and calculate productivity | Mechanical control equipment in the presence of the growing crop | Assigning practical tasks | Discussions and short quiz |

| | | | | | |
|----|---|---|--|---|----------------------------|
| 5 | 2 | a1 / Explains the advantages and disadvantages of the control method | Advantages and disadvantages of the spray control method | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b5/ Learn how to properly operate chemical control and safety equipment while working in the field | Chemical control and safety considerations | Assigning practical tasks | Discussions and short quiz |
| 6 | 2 | a2 / Explains the requirements that must be met by sprinklers | Requirements that must be met in sprinklers | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b6/ Learn how to adjust and change chemical control equipment in the laboratory and field | Adjusting and calibrating chemical spraying equipment | Assigning practical tasks | Discussions and short quiz |
| 7 | 2 | c4 / Shows the most important parts of spray machines | The most important parts of spray machines | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b7/ Identify the components of chemical control equipment and the function of each part | The most important parts of spray equipment | Assigning practical tasks | Discussions and short quiz |
| 8 | 2 | a3 / Shows the most important parts of spray machines | Types of pumps used in sprinklers | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | c2/ Identify the productivity and spraying rate calculations before work and adjust the tractor speed based on those calculations | Calculate productivity and spray rate | Assigning practical tasks | Discussions and short quiz |
| 9 | 2 | a4 / Identify the types of ground sprinklers and their functions | Types of ground sprinklers and their functions | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b8/ Learn how to adjust the operation of the duster and maintain it after each spraying round | Maintenance and adjustment of fogging equipment | Assigning practical tasks | Discussions and short quiz |
| 10 | 2 | c5 / Explains the introduction to duster | Classification of dusters | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b9/ Identify the | The main parts that | Assigning | Discussions |

| | | | | | |
|----|---|--|--|--|----------------------------------|
| | | components of the duster and the function of each part | make up the dusters and their types | practical tasks | and short quiz |
| 11 | 2 | a5 Identify the types of ground dusters | Types of ground dusters and their functions | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b10/ Identify the components of fog diffusers and the function of each part | Fog diffusers | Assigning practical tasks | Discussions and short quiz |
| 12 | 2 | b2 / Identify the types of fogger and smokers | Types of foggers and smokers and their functions | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b11/ Practice operating the knapsack sprayer attached to the tractor in the field | Field training | Assigning tasks and reporting | Discussions and short quiz |
| 13 | 2 | a6 / Identifying spraying and air blowing equipment | Spraying and aerial fogging equipment | Audio styles, writing style, direct dialogue style | Discussion report and short test |
| | 2 | b12/ Identify ways to treat and dilute pesticides, safety when storing them, and cleaning and storing control equipment e1/ Preserving the environment from pesticide pollution | Maintenance and maintenance for the purpose of storage and safety during work | Assigning tasks and reporting | Discussions and short quiz |
| 14 | 2 | b3 / Identify the designs required in spraying aircraft | Necessary considerations for the design and operation of spraying and fogging aircraft | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b13/ A visit to the Nineveh Agriculture Directorate, Research Division | Scientific visit | Assigning tasks and reporting | Discussions and short quiz |
| 15 | 2 | c6 / Explains the types of mechanical control equipment | Types of mechanical control equipment (hoeing) | Dialogue and writing style on the smart board | Discussions and short quiz |
| | 2 | b14/ Identify the types of devices and equipment that contribute to | Determine work paths and field location before and during air control | Assigning tasks and reporting | Discussions and short quiz |

| | | | | | |
|--|--|---|--|--|--|
| | | determining the location of spraying and directing control aircraft in the field. | | | |
|--|--|---|--|--|--|

| 11.Course evaluation | | | | |
|----------------------|-------------------------|------------------------|----------------|----------|
| No. | Evaluation methods | Evaluation date (week) | Grade Relative | weight % |
| 1 | Report 1 | Week 5 | 2.5 | 2.5 |
| 2 | Report 2 | Week 13 | 2.5 | 2.5 |
| 3 | Short test (1) Quiz | Week 3 | 2 | 2 |
| 4 | Short test (2) Quiz | Week 6 | 2 | 2 |
| 5 | Short test (3) Quiz | Week 12 | 1 | 1 |
| 6 | Semester test (1) | Week 6 | 7.5 | 7.5 |
| 7 | Semester test (2) | Week 7 | 7.5 | 7.5 |
| 8 | Final theoretical test | Final semester exams | 40 | 40 |
| 9 | Practical field project | Week 7 | 5 | 5 |
| 10 | Field evaluation | Weeks 13 | 2 | 2 |
| 11 | Final practical test | final semester exams | 20 | 20 |
| 12 | 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 | Food and Agriculture Organization (FAO) |



Course Description Form

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| 1. Course Name: | | | | | |
| Harvesting Equipment | | | | | |
| 2. Course Code: | | | | | |
| HAEQ481 | | | | | |
| 3. Semester / Year: | | | | | |
| The second spring semester/fourth stage/2025-2026 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2026 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| in-person + online | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 90 hours (2 theoretical + 4 practical / 4 units) | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Arkan Mohammad Amin Sedeeq | | | Email: arkanma.agri.col@uomosul.edu.iq | | |
| Name: Othman Muayad Mohammed Tofeq | | | othman.mmt@uomosul.edu.iq | | |
| 8. Course Objectives | | | | | |
| <ul style="list-style-type: none"> • 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 | | | | | |
| <ul style="list-style-type: none"> - 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 |

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| 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 |
| | 4 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 |

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| | | related to the main and auxiliary parts of the grain harvester | | | |
| | 4 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 |
| | 4 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, |

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| | | <p>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</p> | equipment | dialogue and discussion, self-learning | final exam |
| | 4 Practical | <p>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</p> | separating unit regulations | Interactive lecture, brainstorming, dialogue and discussion, self-learning | Short practical test1 |

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| 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 harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, self- learning | Semester exam 1, final exam |
| | 4 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 |

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| | 4 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 |
| | 4 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 |

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| | | each part. The student acquires knowledge and concepts related to equipment for harvesting fiber crops (sugarcane) | | | |
| | 4 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 |
| | 4 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 |

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| | | 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 |
| | 4 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 |

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| | | crops | | | |
| | 4 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 |
| | 4 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 |

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| | | 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 |
| | 4 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 |

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| | | beans. The student should be able to know the equipment for harvesting low-lying leguminous crops (peas). | | training, practical exercises, and self-learning | |
| | 4 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 |
| | 4 Practical | b16: Sustaining cotton harvesting | Sustaining fiber crop harvesting equipment | Interactive lecture, brainstorming, dialogue and discussion, field | short exams, assignment of duty, discussions |

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

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

محمد

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بمدرسة حسن رافق



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