Course Description Form

1. Course Name:

Design and Analysis of Agricultural Experiment

2. Course Code:

DAAE302

3. Semester / Year:

2024 – 2025

4. Description Preparation Date:

1 / 9 / 2024

5. Available Attendance Forms:

Attendance

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

75 hours / 3.5 units

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

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8. Course Objectives

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

9. Teaching and Learning Strategies

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

10. Course Structure

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

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

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

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

11. Course Evaluation

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

12. Learning and Teaching Resources

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