



<b>Form: Course Syllabus</b>	<b>Form Number</b>	EXC-01-02-02A
	<b>Issue Number and Date</b>	2/3/24/2022/2963 05/12/2022
	<b>Number and Date of Revision or Modification</b>	
	<b>Deans Council Approval Decision Number</b>	2/3/24/2023
	<b>The Date of the Deans Council Approval Decision</b>	23/01/2023
	<b>Number of Pages</b>	07

1.	<b>Course Title</b>	<b>Design and analysis of Experiments</b>
2.	<b>Course Number</b>	0341336
3.	<b>Credit Hours (Theory, Practical)</b>	3
	<b>Contact Hours (Theory, Practical)</b>	3
4.	<b>Prerequisites/ Corequisites</b>	0341332
5.	<b>Program Title</b>	B.Sc.
6.	<b>Program Code</b>	
7.	<b>School/ Center</b>	Science
8.	<b>Department</b>	Mathematics
9.	<b>Course Level</b>	Elective Specialization requirement
10.	<b>Year of Study and Semester (s)</b>	3 <sup>rd</sup> or 4 <sup>th</sup> year, 1 <sup>st</sup> and 2 <sup>nd</sup> or summer semester
11.	<b>Other Department(s) Involved in Teaching the Course</b>	None
12.	<b>Main Learning Language</b>	English
13.	<b>Learning Types</b>	<input type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online
14.	<b>Online Platforms(s)</b>	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams
15.	<b>Issuing Date</b>	8/11/2024
16.	<b>Revision Date</b>	

**17. Course Coordinator:**

Name: Amal Helu	Contact hours: 10:30-11:30 am
Office number: 370	Phone number: 22070
Email: a.helu@ju.edu.jo	



#### 18. Other Instructors:

Name:  
Office number:  
Phone number:  
Email:  
Contact hours:  
Name:  
Office number:  
Phone number:  
Email:  
Contact hours:

#### 19. Course Description:

This course introduces the fundamental concepts and techniques in the design and analysis of experiments. Emphasis is placed on understanding the structure of experiments, selecting appropriate designs, and analyzing experimental data using statistical methods. The topics include various ANOVA designs, factorial experiments, and their applications in real life.

#### 20. Program Student Outcomes (SO's):

(To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

- SO1:** Identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of Mathematics and Science and/or technical topics to areas relevant to the discipline
- SO2:** Formulate or design a system, process, procedure or program to meet desired needs.
- SO3:** Develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
- SO5:** Reflect the impact of technical and/or scientific solutions in economic, environmental, and societal contexts.
- SO8:** Utilize techniques, skills, and modern scientific tools such as mathematical packages, statistical software, graphing calculators, and online resources necessary for professional practice

**21. Course Intended Learning Outcomes (CLO's):**

(Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Understand the principles of experimental design and analysis.
2. Apply ANOVA techniques to assess the significance of experimental results.
3. Develop the skills to design, conduct, and analyze randomized and factorial experiments.
4. Implement appropriate designs to improve experimental precision and accuracy.

Course CLOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analysing	evaluating	Creating
CLO (1)	✓	✓	✓			
CLO (2)		✓	✓			
CLO (3)			✓	✓	✓	✓
CLO (4)				✓	✓	✓

**22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:**

Course CLO's \ Program SO's	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	SO (7)	SO (8)
CLO (1)	✓							
CLO (2)	✓		✓					✓
CLO (3)		✓	✓					✓
CLO (4)					✓			✓



### 23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/s Linked to the Topic	Learning Types Face to Face (FF) Blended (BL) Fully Online (FO)	Platform Used	Synchronous (S) Asynchronous (A)	Evaluation Methods	Learning Resources
1	1.1-1.2	Intro to DOE: Concepts & Applications	CLO 1	FF		S	Quiz, Discussion	Notes, Textbook Ch. 1, Articles
2	2.1-2.2	One-Way ANOVA Model, Hypothesis Testing	CLO 2	FF		S	Quiz, Assignment	Notes, Textbook Ch. 2
3	3.1	Post-hoc Analysis & Comparisons (ANOVA)	CLO 2	FF		S	Quiz, Exercise	Notes, Textbook Ch. 2
4	4.1-4.2	Randomized Block Design (RBD)	CLO 3	FF		S	Quiz, Assignment	Notes, Textbook Ch. 3
5	5.1	Two-way ANOVA: Two- factor Design	CLO 3	FF		S	Quiz, Assignment	Notes, Textbook Ch. 4
6	6.1	Main & Interaction Effects (Two- way ANOVA)	CLO 3	FF		S	Quiz, Exercise	Notes, Textbook Ch. 4
7	7.1-7.2	Full Factorial Designs	CLO 4	FF		S	Quiz, Assignment	Notes, Textbook Ch. 5
8	8.1	Application: Factorial Experiments	CLO 4	FF		S	Case study, Project	Notes, Articles
9	9.1-9.2	Fractional Factorial Designs	CLO 4	FF		S	Quiz, Exercise	Notes, Textbook Ch. 6



10	10.1	Identifying Key Factors in Fractional Design	CLO 4	FF		S	Quiz, Assignment	Notes, Textbook Ch. 6
11	-	Review & Integration of Concepts	All CLOs	FF		S	Review Session	Review materials
12-15	-	Final Projects & Presentations	All CLOs	FF		S	Final Project	Project guidelines, Course materials
16							Final Exam	

#### 24. Evaluation Methods:

Opportunities to demonstrate achievement of the CLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Project 1	5%	Application of DOE concepts	CLO 1, CLO 3, CLO 4	Week 8	Classroom
Project 2	5%	Factorial and Fractional Designs	CLO 3, CLO 4	Week 14	Classroom
Pop Quizzes	5%	Various Topics	CLO 1, CLO 2	Weekly	Classroom
Test 1	20%	One-Way ANOVA, Randomized Block Design	CLO 2, CLO 3	Week 6	Classroom
Test 2	20%	Two-Way ANOVA, Factorial Experiments	CLO 3, CLO 4	Week 13	Classroom



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**25. Course Requirements:**

Account on Microsoft Teams.

**26. Course Policies:**

1. All cell phones must be turned off during class. Phones cannot be used during class, even as calculators, to check your answers. Earphones or earbuds may not be used during quizzes, tests, or exams. Texting and browsing the web on phones are not allowed.
2. The questions must be directed to the instructor during the lecture. Disrespectful or disruptive behavior will not be tolerated.
3. If you are late to class or need to leave early, enter and leave the room quietly.
4. Please come to class prepared to participate. Please be courteous to your classmates and keep extra noise to a minimum.
5. Appeal of grading should be submitted in writing within 5 days of receiving the evaluation.
6. Students are responsible for all announcements and supplements given within any lecture.
7. Cheating and plagiarism will not be tolerated. Please see the University of Jordan student Handbook for the definition of cheating and plagiarism and the severe consequences of such behaviors.
8. Food and drink are not allowed in the classroom except bottled water.
9. No guests are allowed in class.

**27. References:**

Textbook: Montgomery, D.C. Design and Analysis of Experiments, 10th Edition.

**28. Additional information:**

1. Do not miss any classes.
2. Print out and review the lecture notes before each class.
3. Take notes directly on the printed materials.
4. Collaborate in groups of two or more.
5. If you are experiencing significant difficulties, please see me or make an appointment right away.

Name of the Instructor or the Course Coordinator: <b>Prof. Amal Helu</b>	Signature: .....	Date: 31/10/2024
Name of the Head of Quality Assurance Committee/ Department: <b>Prof. Manal Ghanem</b>	Signature: .....	Date: .....
Name of the Head of Department: <b>Prof. Baha Alzalg.</b>	Signature: .....	Date: .....
Name of the Head of Quality Assurance Committee/ School of Science: <b>Prof. Emad A. Abuosba</b>	Signature: .....	Date: .....
Name of the Dean or the Director: <b>Prof. Mahmoud I. Jaghoub</b>	Signature: .....	Date: .....