



Course Specification

— (Bachelor)

Course Title: **Experimental Design**

Course Code: **STAT 337**

Program: **Statistics**

Department: **Statistics and Operations Research**

College: **Sciences**

Institution: **King Saud University**

Version: **2**

Last Revision Date: **15-03-2024**

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4



C. Course Content	4
D. Students Assessment Activities	5
E. Learning Resources and Facilities	5
F. Assessment of Course Quality	5
G. Specification Approval	6





A. General information about the course:

1. Course Identification

1. Credit hours: 3(2+1+0)					
2. Course type					
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department	<input type="checkbox"/> Track	<input type="checkbox"/> Others
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective		
3. Level/year at which this course is offered: (6th/3rd)					
4. Course general Description:					
<p>The course contains a various topics and techniques of Data Analysis using statistical software.</p> <ul style="list-style-type: none"> ▪ Introduction: Some typical applications of experimental design, basic principles, guidelines for designing experiments, and using statistical techniques in experimentation. ▪ Statistical inference: about the differences in means, randomized designs, and about the variances of normal distributions. ▪ Experiments with a Single Factor (Completely Randomized Design CRD): (The Analysis of Variance): <ul style="list-style-type: none"> - Fixed and random effect model with balance and unbalance data. - Contrasts and Multicomparisons among treatment means (Tukey, LSD Fisher, Dunnett , Scheffe, Bonferroni). - determining Sample Size. ▪ Randomized Blocks, Latin Squares. <ul style="list-style-type: none"> - The Randomized Complete Block Design (RCBD). - The Latin Square Design. - Balanced Incomplete Block Designs (BIBD) ▪ Introduction to Factorial Designs. <ul style="list-style-type: none"> - The Two-Factor Factorial Design - The General Factorial Design. ▪ The 2k Factorial Design <ul style="list-style-type: none"> - The 22 Factorial Design - The 23 Factorial Design ▪ Regression and Analysis of Covariance 					
5. Pre-requirements for this course (if any):					
Stat 328					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					



Students after completing the course will have:

- Ability to use and integrate statistical techniques in any scientific inquiry.
- Providing the student with the skill in choosing the appropriate design to carry out the experiment.
- Understanding how to select the best methods to analysis data by using statistical packages.
- Ability to give right interpretations of statistical results.
- The skills to prepare and write statistical reports.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	15
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Knowledge of essential steps in data analysis.	K3	Lecture	Written exam
1.2	Memorizing statistical methods and techniques in data analysis.	K2	Lecture	Written exam





Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.3	Distinguishing between different statistical methods and techniques.	K3	Lecture	Written exam
2.0	Skills			
2.1	Ability to efficiently describe real data providing statistical measures and graphs.	S1	Lecture laboratory/Studio	Written exam
2.2	Applying the right statistical methods and techniques to answer given questions and data.	S1	Lecture laboratory/Studio	Written exam
2.3	Statistically interpreting results and drawing conclusion.	S3	Lecture laboratory/Studio	Written exam
3.0	Values, autonomy, and responsibility			
3.1	Work in team	V1	Lecture	Homework
3.2	Acquire self-learning	V2	Lecture laboratory/Studio	Written exam

C. Course Content

No	List of Topics	Contact Hours
1.	Statistical effect models	6
2.	Estimation methods for regression coefficients	6
3.	Estimating missing observations	3
4.	Comparison testing	6
5.	Block design	9
6.	Factorial design	9
7.	Association testing	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Exam 1	7 th	20
2.	Exam 2	13 th	20



No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
3.	Project	14 th	10
4.	Home Works	1 st -14 th	10
5.	Final Exam	15 th	40

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Design and Analysis of Experiments 10th edition. Wiley and Sons D. C. Montgomery, 2017
Supportive References	
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom Computer lab
Technology equipment (projector, smart board, software)	R Statistical software
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students assessment	Quality committee	Indirect
Quality of learning resources	Instructor	Direct
The extent to which CLOs have been achieved	Course coordinator	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)





G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL/ PLANS COMMITTEE / ACADEMIC ACCREDITATION COMMITTEE (BACHELOR)/DR. MAHMOUD ALDERINY
REFERENCE NO.	
DATE	//13-12-2024/5-04-2024

