



Course Specifications

Course Title:	Design and Analysis of Experiments
Course Code:	STAT 337
Program:	B.Sc. Statistics
Department:	Statistics & Operations Research
College:	College of Science
Institution:	King Saud University

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A. Course Identification

1. Credit hours:	3(2+1+0)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	7 th level/Senior (4 th year)
4. Pre-requisites for this course (if any):	STAT 328 (Statistical Packages)
5. Co-requisites for this course (if any):	None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description	
This course Introduces the basics and essentials of Design of Experiments.	
2. Course Main Objective	
Introduction, Review of statistical inference. Main principals of experimental design (Replication -Randomness – Blocks). Simple comparisons experiments, t-test and alike tests. Block designs. Randomized complete block design. Latin square design. Graeco-Latin square design. Factorial designs. Two-Factor factorial design. Three-Factor factorial design. General factorial designs	
3. Course Learning Outcomes	
	CLOs
	Aligned PLOs
1	Knowledge and Understanding

CLOs		Aligned PLOs
1.1	Knowledge of basics of experimental designs and ANOVA	K1
1.2	Knowledge of basics and essentials of statistical inferences in experimental design and ANOVA	K1
1.3	Knowledge of the essentials of choosing the appropriate model	K3
1...		
2	Skills :	
2.1	Ability of analyzing data	S1
2.2	Ability of choosing and using appropriated methods for analyzing deal life problems.	S1
2.3	Ability of choosing appropriated models for the data at hand.	S3
2...		
3	Values:	
3.1	Communicate and work with teams.	C1
3.2	Responsibility of self-learning.	C2
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction, Review of statistical inference. Main principals of experimental design (Replication -Randomness – Blocks), Simple comparisons experiments, t-test and alike tests.	12
2	Single Factor Experiments: Completely randomized design - Model adequacy checking - Contrasts and orthogonal contrasts - Comparing pairs of treatment means.	12
3	Block designs: Randomized complete block design - Latin square design - Graeco-Latin square design.	12
4	Factorial designs. Two-Factor factorial design.	12
5	Three-Factor factorial design. General factorial designs.	12
...		
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Knowledge of basics of experimental designs and ANOVA	Lectures and Tutorials	Home works and Exams
1.2	Knowledge of basics and essentials of statistical inferences in experimental design and ANOVA	Lectures and Tutorials	Home works and Exams
1.3	Knowledge of the essentials of choosing the appropriate model	Lectures and Tutorials	Home works and Exams
2.0	Skills		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	Ability of analyzing data	Lectures and Tutorials	Home works and Exams
2.2	Ability of choosing and using appropriated methods for analyzing deal life problems.	Lectures and Tutorials	Home works and Exams
2.3	Ability of choosing appropriated models for the data at hand.	Lectures and Tutorials	Home works and Exams
3.0	Values		
3.1	Communicate and work with teams.	Lectures and Tutorials	Home works and Exams
3.2	Responsibility of self-learning.	Lectures and Tutorials	Home works and Exams
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home works	Regularly	10%
2	First mid-term test	6	25%
3	Second mid-term test	11	25%
4	Final exam	16	40%
5			
6			
7			
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Office hours: 4 hours/ week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Design and Analysis of Experiments, D. C. Montgomery, Wiley and Sons
Essential References Materials	Notes + Slides + Books
Electronic Materials	Some statistical Software such as MINITAB, SAS, ..
Other Learning Materials	Some Recommended Textbooks and Reference Material: – Design and Analysis of Experiments, Roger G. Petersen

	<ul style="list-style-type: none"> – Experimental Design (Second ed.) Cochran, W. G. and G. M. Cox – Statistical principles in experimental design, Winer, B. J., McGraw-Hill. – Experimental design; procedures for the behavioral sciences, Kirk, Roger E, Brooks/Cole Pub. Co. – Experimental design and statistics, Miller, Stephen Henry, Methuen – Statistics and experimental design, Clarke, Geoffrey Mallin, Edward Arnold – Fundamentals of experimental design, Myers, Jerome L., Allyn and Bacon <p>Slides Blackboard (Data show).</p>
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2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	There should be no more than 20 students in the classroom At least 20 Computers in the lab are required. Laboratories equipped with suitable number of computers
Technology Resources (AV, data show, Smart Board, software, etc.)	Statistical software, data show, Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Classroom projectors and Smart Board

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Evaluation form that students fill at the end of each semester, to evaluate the course and the teacher.	students	Electronic questionnaires vis KSU Academic Edugate
Faculty periodical evaluation of syllabus	Teachers	Periodical Reviewing

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Prof. Dr. Abdullah Al-Shiha
Reference No.	
Date	2 May 2021