



Course Specifications

Course Title:	Statistical Methods
Course Code:	2040 Stat
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Faculty of science and humanity studies
Institution:	Prince Sattam Bin Abdul Aziz University, Saudi Arabia

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A. Course Identification

1. Credit hours: 4 Hours	
2. Course type	
a. University <input type="checkbox"/>	College <input checked="" type="checkbox"/> Department <input 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: Level 5	
4. Pre-requisites for this course (if any): Stat 2010	
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	4 hours a week	100%
2	Blended	-	-
3	E-learning	-	-
4	Distance learning	-	-
5	Other	-	-

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	48
2	Laboratory/Studio	-
3	Tutorial	00
4	Others (specify) – 5 office hours a week	60
	Total	108

B. Course Objectives and Learning Outcomes

<p>1. Course Description</p> <p>Some Statistical Distributions (Without Proofs) – Sampling Distributions – Central Limit Theorem (Without Proof) – Chebychev's Inequality – Interval Estimation (Two Populations Case) – Testing Hypotheses (Two Populations Case) – Correlation (Pearson and Spearman) – Regression (Simple Regression) – Chi Square Tests and Applications – ANOVA (One and Two Ways) – Some Non-parametric Tests – Introduction to Experimental Designs (CRD and RBD).</p>
<p>2. Course Main Objectives</p> <ul style="list-style-type: none"> • Study some important statistical distributions (Normal Distribution). • Know the students with the sampling distribution and central limit theorem. • Learn the students to the topics of inferential statistics (Estimation & Hypotheses testing). • Study the estimation of some population parameters (One and two population case). • Study the testing hypotheses of some population parameters (One and two population). • Teach the students the concept of correlation (Pearson and Spearman) with applications. • Teach the students the concept of regression (Simple Regression) with applications. • Study some Chi square tests and applications and some non-parametric tests. • Provide the students with the concept of ANOVA (One and Two Ways).

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Develop knowledge and broad understanding about various testing methods and their use	K3
2	Skills:	
2.1	Evaluate Correlation and regression coefficients and check various testing hypothesis	S2

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to the course	-
2	The Normal Distribution <ul style="list-style-type: none"> • Test for normality • The Sampling Distributions • The Central Limit Theorem 	4
3	Confidence Intervals and Sample Size <ul style="list-style-type: none"> • Point and Interval Estimation • Confidence Intervals and Sample Size for the Mean when σ is Known 	4
4	<ul style="list-style-type: none"> • Confidence Intervals for the Mean when σ is Unknown • Confidence Intervals and Sample Size for Population Proportion • Confidence Intervals for population variance and standard deviation 	4
5	Hypothesis Testing <ul style="list-style-type: none"> • Steps in Hypothesis Testing • z Test for a Mean 	4
6	<ul style="list-style-type: none"> • t Test for a Mean • z Test for a Proportion • Chi-square Test for the variance and standard deviation 	4
7	Testing the Difference Between Two Means, Two Proportions <ul style="list-style-type: none"> • Testing the Difference Between Two Means Using the z Test • Testing the Difference Between Two Means Using the t Test 	4
8	<ul style="list-style-type: none"> • Testing the Difference Between Two Proportions • Testing the Difference Between Two Variances 	3
9	Correlation and Regression <ul style="list-style-type: none"> • Scatter Plots and Correlation • Coefficient of Correlation • Testing the significance of the population correlation coefficient 	3
10	<ul style="list-style-type: none"> • Simple Regression • Equation of a Regression Line • Standard error of the estimate 	3
11	Other Chi-Square Tests <ul style="list-style-type: none"> • Tests for Goodness of Fit • Tests Using Contingency Tables (Test for Independence & Test for Homogeneity) 	3

12	Analysis of Variance • One-Way Analysis of Variance	3
13	Nonparametric Statistics • Advantages and Disadvantages of Nonparametric Statistics • The Sign Test • The Wilcoxon Rank Sum Test	3
14	• Introduction to Experimental Designs (CRD and RBD).	3
15	General Review	3
Total		48

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	Develop knowledge and broad understanding about various testing methods and their use	1. Class Room Lectures 2. Interactive sessions 3. Exclusive Office Hours for clearing doubts in small groups	1. Two Internal Exams 2. At least two Quiz 3. End Semester Exam
2.0	Skills		
2.1	Evaluate Correlation and regression coefficients and check various testing hypothesis	1. Application oriented exercises during tutorial session. 2. Homework to improve the analytical skills	Specific homework to increase the students' analytical and problem solving ability 1. Homework 2. Assignments 3. Quiz

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid Term Exam I	6	20%
2	Quiz	4 & 10	5%
3	Mid Term Exam II	13	20%
4	Continuous Assessment – Homework, Assignment, Attendance etc.	--	5%
5	End Semester Exam (Practical 10%, Theory 40%)	15	50%

*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 to help students and solve their problems (5 Hours per week).
- Academic Advising for Students (2 Hours per week).

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Allan G. Bluman, Elementary Statistics A Step by Step Approach, 8th Edition, 2012, McGraw.
Essential References Materials	Journals, Reports, etc
Electronic Materials	Web Sites, Social Media, Blackboard, etc.
Other Learning Materials	Computer-based programs/CD, professional standards or regulations and software, Lecture Notes Prepared by the Department of Mathematics

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with Smart boards with suitable number of student in each room.
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart board, Internet Connection for Blackboard
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students, Graduates	Course Evaluation and Program Evaluation Survey (Indirect)
Head of department reports.	Program Leaders	Peer Review (Direct)
Achievement of CLOs	Faculty and Quality Personnel	Direct (Tests and Quiz) and Review of Course Report
Quality of Learning Resources	Students	Course Evaluation (Indirect)
Annual course reports. Departmental review of course ILO"s.	Graduates	Program Evaluation(Indirect)
Facilities	Students / Graduates	Course and Program Evaluation (Indirect)
	Faculty	Faculty Survey (Indirect), Course Reports (Direct)

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	
Reference No.	
Date	