



Course Specifications

Course Title:	Mathematical Statistics
Course Code:	323STAT-3.
Program:	Bachelor in Mathematics
Department:	Program of Mathematics
College:	College of Arts and Sciences
Institution:	Najran University.



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A. Course Identification

1. Credit hours:3			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
3. Level/year at which this course is offered: Level 6 / Third Year			
4. Pre-requisites for this course (if any): Principles of Statistics and Probability- probability theory.			
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	3	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	٤٥
2	Laboratory/Studio	٠٠
3	Tutorial	٠٠
4	Others (specify)(Test1 and Test 2)	٣
	Total	٤٨
Other Learning Hours*		
1	Study	30
2	Assignments	10
3	Library	٠٠
4	Projects/Research Essays/Theses	٠٠
5	Others(specify)(Office hours)	15
	Total	١٠٣

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes:**1. Course Description:**

The statistic is one of the branches of applied mathematics. The student must have a good knowledge of mathematics as well as probability theory. This course introduce : Sampling distribution, Sampling from normal population, Law of Large numbers , Central limit theorem, With a comprehensive presentation of the estimation theory and Testing Hypotheses. The content is presented in a presentation that includes basic definitions and derived to theorems, with the introduction of applications for each subject.

2. Course Main Objective:

The main objective is study the random sampling concepts, and to provide the mathematical ability to derive the theorems , understand the central limit theorem and study to statistical inference from through the estimation theory and hypothesis testing.

3. Course Learning Outcomes:

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Describe the meaning of Sampling distribution, Sampling from normal population and differentiate between Probability Sampling distributions.	
1.2	Recognize basic concepts of estimation theory and hypothesis testing for use in different applications.	
1.3		
2	Skills :	
2.1	Apply the meaning of Sampling distributions, Law of Large numbers and Central limit theorem in solving various problems. .	
2.2	Employ mathematical knowledge to derive all theorems related to Probability Sampling distributions.	
2.3	Use mathematical techniques in applications of estimation theory and hypothesis testing.	
2...		
3	Competence:	
3.1	Work effectively with in groups and independently	
3.2	Apply critical thinking, communication skills and mathematical and statistical techniques in solving many problems in other disciplines.	
3.3		

C. Course Content:

No	List of Topics	Contact Hours
1	Sampling distributions (Sampling distribution, Sampling from normal population, Parameter and Statistic, Random Sampling, Sampling distribution of the Sample mean and Sample variance, Chebyshev's inequality, Law of Large numbers , Central limit theorem).	12
2	Probability Sampling distributions (Chi-Square distribution, t-distribution and F-distribution).	12
3	Estimation theory (Point estimation, Properties of estimators, The moments method, The likelihood estimators method) , Precision of	12

	estimation, The standard error, Single sample confidence interval estimation, Tow sample confidence interval estimation).	
4	Testing Hypotheses (General concepts, Testing a statistical hypotheses, single and tow samples testing).	9
Total		٤٥

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		
1.1	Describe the meaning of Sampling distribution, Sampling from normal population and differentiate between Probability Sampling distributions.	•Lectures •Discussion in small groups .	-Quarterly Tests . -A final test.
1.2	Recognize basic concepts of estimation theory and hypothesis testing for use in different applications.		
...			
2.0	Skills		
2.1	Apply the meaning of Sampling distributions, Law of Large numbers and Central limit theorem in solving various problems. .	Lectures - small discussion groups - homework .	Activities and tasks assigned by the students during the learning and teaching process and then in the form of duties.
2.2	Employ mathematical knowledge to derive all theorems related to Probability Sampling distributions.		
2.3	Use mathematical techniques in applications of estimation theory and hypothesis testing.		
3.0	Competence		
3.1	Work effectively with in groups and independently	Solve exercises through individual work and groups.	Solving exercises and Home work. Written tests.
3.2	Apply critical thinking, communication skills and mathematical and statistical techniques in solving many problems in other disciplines.		
...			

2. Assessment Tasks for Students:

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First exam	7	20 degrees
2	Second exam	12	20 degrees
3	Home work and Assignments/Quizzes	Every week	10 degrees
4	Final exam	16	50 degrees

*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.
- Provide academic guidance services.
- Introduce students to the course plan in terms of objectives, content and evaluation procedures.

F. Learning Resources and Facilities:**1. Learning Resources**

Required Textbooks	1) Introduction to Mathematical Statistics , Robet V. Hogg , Joeseeph Mckean Allen T. Craig Seventh edition, 2014. 2) Probability & Statistics for Engineers & Scientists, R. Walpole, R. Myers, S. Myers, K. Ye, Pearson Education International, 9th Edition, 2012.
Essential References Materials	1. Mathematical Statistics with Applications, D. Wackerly, W. Mendenhall, R.L. Scheaffer, Brooks/Cole-Cengage Learning, 7th Edition, 2008. 2. Probability and Statistics in Engineering, William W. Hines, Douglas C. Montgomery, David M. Goldsman, Connie M. Borror, John Wiley & Sons Inc, 4th Edition, 2003. 3. Introduction to Mathematical Statistics, R. Hogg et al, Prentice Hall, 2004.
Electronic Materials	<ul style="list-style-type: none"> Electronic materials available on the internet.
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> The number of seats in the classroom is at least 40 seats.
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> Halls equipped with modern learning techniques and different display devices.
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 - Leadership Program.	Direct and Indirect
Effectiveness of assessment	Students - Leadership Program - Peer References.	Indirect
Extent of achievement of course learning outcomes	Students - Leadership Program.	Indirect
Quality of learning resources	Students - Leadership Program.	Indirect

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	