



Course Specifications

Course Title:	Probability Theory.
Course Code:	322STAT-3
Program:	Bachelor in Mathematics
Department:	Program of Mathematics
College:	College of Arts and Sciences
Institution:	Najran University.



Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	4
1. Course Description.....	4
2. Course Main Objective	4
3. Course Learning Outcomes.....	4
C. Course Content.....	4
D. Teaching and Assessment.....	5
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods.....	5
2. Assessment Tasks for Students	5
E. Student Academic Counseling and Support	6
F. Learning Resources and Facilities	6
1. Learning Resources.....	6
2. Facilities Required	6
G. Course Quality Evaluation.....	6
H. Specification Approval Data	6

A. Course Identification:

1. Credit hours:			
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 0 / Third Year			
4. Pre-requisites for this course (if any): Principles of Statistics and Probability			
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 Test2)	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	٥٥

*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**

This course introduce : Random variables and probability functions, Bivariate random variables and joint probability functions, Mathematical expectation, Variance, Covariance, Correlation, Conditional Probability Functions, Moments, Moment generating function, Discrete Probability Distributions and Continuous probability distributions.

2. Course Main Objective

The main objective is study of the concept of discrete random variables , continuous random variables and their probability functions and the study of some the discrete probability distributions and continuous probability distributions.

3. Course Learning Outcomes:

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Identify the related basic scientific facts, concepts, principles and techniques in probability theory.	
1.2	Described the importance of random variables characteristics and probability functions	
1...		
2	Skills :	
2.1	Demonstrate the different characteristics (Expectation-Variance - Moments) of random variables from basic definition.	
2.2	Explain the assumptions for each of the discrete and continuous probability distributions	
2.3	Employ mathematical knowledge to derive all relevant laws of probability distributions.	
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...		

C. Course Content:

No	List of Topics	Contact Hours
1	Random Variables and probability function(Meaning of random variable, Discrete random variables, Continuous random variables , Functions of Random variables).	6
2	Bivariate random variables(Meaning of Bivariate random variable, Bivariate discrete random variables, Bivariate continuous random variables, Functions of Bivariate random variables).	6
3	Mathematical expectation and Variance (Mathematical expectation, Variance, Expectation of random variables, Mathematical expectation of Bivariate random variables, Covariance, Correlation).	9
4	Conditional functions (Conditional Probability Functions, Conditional Expectation, Conditional Variance) and Moments, Moment generating function.	6
5	Discrete Probability Distributions(The discrete uniform distribution, Bernoulli	

	distribution, Binomial distribution, The hyper geometric distribution, Geometric distribution, Negative Binomial distribution, Poisson distribution).	9
...	Continuous probability distribution (Continuous Uniform Distribution, Exponential distribution, Gamma distribution, Beta distribution, Normal distribution).	9
Total		45

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	Identify the related basic scientific facts, concepts, principles and techniques in probability theory.	<ul style="list-style-type: none"> •Lecture •Discussion in small groups around a certain idea or a proble 	-Quarterly Tests . -A final test.
1.2	Described the importance of random variables characteristics and probability functions.		
...			
2.0	Skills		
2.1	Demonstrate the different characteristics (Expectation-Variance - Moments) of random variables from basic definition.	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	Explain the assumptions for each of the discrete and continuous probability distributions		
2.3	Employ mathematical knowledge to derive all relevant laws of probability distributions.		
3.0	Competence		
3.1	Work effectively with in groups and independently	Solve exercises through individual work and groups. Lectures, discussion and dialogue	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	- جلال الصياد، ٢٠٠٨م، نظرية الاحتمالات ، دار حافظ للنشر والتوزيع – جدة.
Essential References Materials	- أنيس إسماعيل كنجو ، 2016م، مدخل إلى نظرية الاحتمال ، الطبعة الأولى ، الترقيم العالمي – 978-9933-10-662-1: ISBN Prasanna Sahoo, 2013, "Probability and mathematical statistics" Louisville, KY 40292 USA.
Electronic Materials	<ul style="list-style-type: none"> • Electronic materials available on the internet. • Lectures on the Department of Mathematics YouTube Channel.
Other Learning Materials	None

2. Facilities Required:

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• The number of seats in the classroom is at least 40 seats.
Technology Resources (AV, data show, Smart Board, software, etc.)	• 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	