Course Specification

— (Bachelor)

Course Title: **Introduction to Probability**

Course Code: **STS133**

Program: **Applied Statistics & Data Management**

Department: **Mathematics**

College: **College of Science**

Institution: **Majmaah University, Saudi Arabia**

Version: **2023**

Last Revision Date: **28/9/2023**

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A. General information about the course:

1. Course Identification

1. Credit hours: 3(2+2)

2. Course type

A.	☐University	☐College	☐Department	☐Track	Others
B.	☒Required			☐Elective	

3. Level/year at which this course is offered: (…LEVEL 3…….)

4. Course general Description:

1. **Course Description :**
Random variables - Probability distributions (Discrete and continuous) - Famous discrete probability distributions - Famous continuous probability distributions - Random vectors - Expectation and variation - Discrete bivariate probability distributions - Marginal and conditional probability distributions - Independence, correlation and covariance - Moments and moment generating function - Distributions of Function of one and two random variables (transformations).

5. Pre-requirements for this course (if any): **STS121**

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

- Students will be able to Know the basic concept Introducing basic concepts of Random variables - Probability distributions (Discrete and continuous)
- Students will be able to know the Famous discrete and continuous probability distributions – Random vectors
- Students will be able to know the Expectation and variation - Discrete bivariate probability distributions - Marginal and conditional probability distributions - Independence, correlation and covariance - Moments and moment generating function
- Students will be able to know the distributions of functions of random variables (Transformations).

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	42	70%
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning	18	30%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	40
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	20
5.	Others (specify)	
	Total	60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define the discrete and continuous distributions and solve the problems about these distributions.	K1	Begin each topic with the explanation of various basic ideas giving plenty of examples Start each section by general idea and the benefit of it. Demonstrate the course information and principles	Exams Midterms Final examination
1.2	Define the concept of a random variable	K1	Provide several ways to deal with the exercises.	Home work. Classroom activities group work.
1.3	Calculate the expected value and variance of a random	K1	Solve some examples	Continuous discussions with the

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	variable.		during the lectures.	students during the lectures.
1.4	Calculate the moments and formulates the Moment Generating Function.	K1		
2.0	Skills			
2.1	The students will explain and interpret the basic fundamentals in Statistics	S1	Encourage the student to look for some application problems in other references.	Oral and written exams Quizzes.
2.2	Enable students to analyses the mathematical problems.	S1	Ask the student to attend lectures for practice solving problem	Doing homework. Check the problems solution
…				
3.0	Values, autonomy, and responsibility			
3.1	The ability for collaboration and problem solving	v2		

C. Course Content

No	List of Topics	Contact Hours
1.	Random variables - Probability distributions (Discrete and continuous) - Famous discrete probability distributions	7
2.	Famous continuous probability distributions	7
3	Random vectors - Expectation and variation	10
4	Discrete bivariate probability distributions - Marginal and conditional probability distribution	12
5	Independence, correlation and covariance - Moments and moment generating function	12
6	Distributions of Function of one and two random variables (Transformations).	12
	Total	60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Midterm 1**	**8th week**	**30 %**
2.	**E-Test**	**11th week**	**10 %**
3.	**Quiz**	**During the semester week**	**10 %**
.4	**Homework + Attendance**	**During the semester**	**10 %**
5	Final exam	**End of sem.**	**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	Probabilities Theory and Its Applications, Dr. Mohammed Ibraheem Akeel, and Dr. Abdul-Rahman Mohammed Abu-Ammoah, King Saud University,1427
Supportive References	Probabilities Theory, Dr. Jalal Mostafa Assyad, 1427
Electronic Materials	Modern Probability Theory and Its Applications, Emanuel Parzen, John Wiley & Sons, wileym2001
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Class room
Technology equipment (projector, smart board, software)	Hall is equipped with a computer. - Provide overhead projectors and related items - Smart board
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Staff Member	Direct: electronically
Effectiveness of students assessment	Student	Electronically

Assessment Areas/Issues	Assessor	Assessment Methods
Quality of learning resources		
The extent to which CLOs have been achieved		
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	