هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

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Course Specification

Course Title:	**Probability Theory**
Course Code:	**322STAT-3**
Program:	**B.Sc. of Mathematics**
Department:	**Mathematics**
College:	**Arts and Sciences**
Institution:	**Najran University**
Version:	**1**
Last Revision Date:	**07-05-2023**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	5/3				
4. Course general Description: This course introduces: random variables and their probability functions, double random variables and their joint probability functions, mathematical expectation, variance, covariance, correlation, conditional probability functions, moments, moment generating function, in addition to discrete probability distributions and continuous probability distributions.					
5. Pre-requirements for this course (if any): Principles of Statistics and Probability (121STAT-3)					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s): Studying the concept of discrete and continuous random variables and their probabilistic functions for a single random variable and a double random variable with mathematical expectation, variance, correlation, conditional functions, moment generation function, and a comprehensive study of some the discrete probability distributions and continuous probability distributions.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	3	100%
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	

	Total	45

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 basic scientific facts, characteristics, concepts, principles and technique, which the related of random variables (univariate and bivariate) and probability distributions (discrete and continuous).	K1	• Lecture • Cooperative learning • Problem solving	• Assignments • Quizzes • Midterm • Final Exam .
2.0	Skills			
2.1	Demonstrate the ability to deal with the types of discrete and continuous univariate random variables and the application of laws in solving the different problems.	S1	• Lecture • Cooperative learning • Problem solving	• Assignments • Quizzes • Midterm • Final Exam
2.2	Develop the concepts of univariate random variables to bivariate random variables and the application of various laws in solving the different problems.			
2.3	Solve problems using probability distributions (discrete and continuous).			
2.4	Derive some relevant theorems with probability distributions (discrete and continuous).	S2		
3.0	Values, autonomy, and responsibility			
3.1				

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

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Exam	7	20%
2.	Assignments & Quizzes	During classes	10%
3.	Second Exam	13	20%
4.	Final Exam	16	50%

*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	- جلال الصياد, 2008م ,نظرية الاحتمالات , دار حافظ للنشر والتوزيع – جدة.
Supportive References	- أنيس إسماعيل كنجو , 2016م, مدخل إلي نظرية الاحتمال , الطبعة الأولي , الترقيم العالمي – ISBN: 978-9933-10-662-1 Prasanna Sahoo, 2013, "Probability and mathematical statistics" Louisville, KY 40292 USA.
Electronic Materials	• Electronic materials available on the internet. • Lectures on the Department of Mathematics YouTube Channel.
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	- Blackboard Platform - SPSS Program, R Software - Projector
Other equipment (depending on the nature of the specialty)	**N/A**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Council of Mathematics Department
REFERENCE NO.	14441017-0208-00014
DATE	17-10-1444H