Course Specification
(Bachelor)

Course Title:	Probability and Engineering Statistics
Course Code:	285Stat-3
Program:	B.Sc. of Computer Science + Information Systems
Department:	Computer Science and Information Systems
College:	Computer Science and Information Systems
Institution:	Najran University
Version:	2
Last Revision Date:	17-05-2025

Table of Contents

A. General information about the course:

1. 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 addresses the basic concepts of descriptive statistics namely data types and data sources, presenting data in charts and tables and presentation and description of statistical data, measures of central tendency, measures of dispersion, variation coefficient, measures of skewness, kurtosis measure, regression and correlation and basic concept of probabilities, random variables and probability functions, mathematical expectation, some discrete and continuous distributions.					
5. Pre-requirements for this course (if any):					
none					
6. Co-requisites for this course (if any):					
none					
7. Course Main Objective(s):					
The main objective of this course is providing students knowledge of the basic concepts related to the principles of statistics, probability theory and random variables with the transfer of student from the stage of description to the stage of decision-making and problems solving.					

2. 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		

3. 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 PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Define** key concepts in statistics and probability, including population, sample, and random variable.		Lecture Cooperative learning Problem solving Brainstorming	Assignments Quiz Midterm Exam Final Exam
1.2	**Explain** descriptive measures such as central tendency, dispersion, and skewness.			
1.3	**Describe** basic probability rules and probability distributions (binomial, Poisson, normal, etc.).			
2.0	**Skills**			
2.1	Apply statistical methods for analysis of categorical and numerical data.		Lecture Cooperative learning Problem solving Brainstorming	Assignments Quiz Midterm Exam Final Exam
2.2	Provide all principles, theorems, laws, and methods for performing mathematical operations to solving mathematical problems in descriptive statistics.			
2.3	Calculate probabilities by using basic laws and the relationships between events to solving mathematical problems in principles of probability theory.			

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.4	Demonstrate the ability to deal with the types of random variables and to distinguish between the different problems of random variables and their properties.			
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively with in groups and independently			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction (Importance of statistics, Definition of statistics, Statistical data, Sources of data, Methods of data collection, Population and sample, Parameter and statistic)	3
2.	Presentation and description of statistical data (Frequency distributions, Relative frequency, Cumulative frequency distributions, Graphic Presentations, Forms of distributions, Introduction of samples).	3
3.	Measures of central tendency (Arithmetic mean, Geometric mean, harmonic mean, Median, Mode, Approximate relation of the mean, median and mode, Deciles, quartiles and percentiles).	9
4.	Measures of dispersion (Rang, Mid - quartile rang, Mean deviation, Variance, Standard deviation).	6
5.	Variation coefficient, Quartile variation coefficient, Measures of skewness (Pearson coefficient, Quartile skewness coefficient and Percentile skewness coefficient), Kurtosis measure (or Peakedness) and Correlation and regression.	6
6.	Introduction of probability (Principle of counting, Meaning of probability, Basic definitions, Axioms of probability, Relationship between random events, Basic lows, Conditional probability, Independent events, Bayes rule, Bayes theorem).	9
7.	Random variables and probability functions, Mathematical expectation, Variance and Probability distributions (Binomial distribution, Poisson distribution and Uniform distribution, Exponential distribution, Normal distribution).	9
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exams	6-8 11-13	20 20
2.	Assignments & Quizzes	During classes	10
3.	Final Exam	16-18	50
4.	Final Exam	16-18	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	- Prem S. Mann, "Introductory Statistics", Wiley, 9th Edition, 2016. - Jay Devore, Probability and Statistics for Engineering and the Scientists, California Polytechnic State University, San Luis Obispo, 2010.
Supportive References	- Richard j. and Gouri B. , Statistics Principles and Methods., JOHN WILE , SONS, 1985. - R.E Walpole, R.H. Myers, probability and statistics for engineers and scientists ,Macmillan publishing 1998. - Mendenhall and Tsincich , statistics for engineers and scientists , prentice Hall , Fourth Edition , 1995.
Electronic Materials	- Electronic materials available on the internet. - Lectures on the Department of Mathematics YouTube Channel.
Other Learning Materials	

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 - Mathematica Program 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		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	