Course Specification
(Bachelor)

Course Title:	**Statistics and Probability**
Course Code:	**262Math-3**
Program:	**BS in Computer and Network Engineering**
Department:	**Computer Science**
College:	**Computer Science and Information Technology**
Institution:	**Jazan University**
Version:	**2024**
Last Revision Date:	**2/2024**

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: **Level 4 / Year 2**

4. Course general Description:

This course introduces statistics and probability with applications. This course also covers several topics specifically Graphs, Measure of Central Tendency, Measure of Dispersion, Probability Theory, Random Variables, Probability Distributions, Correlation and Linear Regression.

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

6. Co- requirements for this course (if any): None

7. Course Main Objective(s):

After finishing the course, the student is expected to be familiar with the following:

- Familiarize with the concepts and principles of Statistics, Graphs and Probability.
- Describe concepts of Measures of Central Tendency and measure of Dispersion.
- Explain probability theory and methods to construct the probability distribution of random variables based on real world situations and use it to compute expectation and variance.
- Describe various methods to compute probabilities based on practical situations using Poisson, Binomial and Normal distribution.
- Provide concepts of Correlation and Linear Regression and application of these concepts for trend calculation.

2. Teaching mode **(mark all that apply)**

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	45	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	42
2.	Laboratory/Studio	

3.	Field	
4.	Tutorial	3
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	Distinguish mathematical concepts relevant to Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal Distribution, Scatter Plots and Correlation Regression.	K1	Lectures, Web based work, Classroom dissections .	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
1.2	Identify background science, features and structure of Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal Distribution, Scatter Plots and Correlation Regression.	K2	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
1.3	Explain notations and concepts required for the solution of Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal Distribution, Scatter Plots and Correlation Regression.	K3	Lectures, Web based work, Classroom dissections .	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.0	Skills			
2.1	Apply theoretical, computational or practical aspect relevant to Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal	S1	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	Distribution, Scatter Plots and Correlation Regression.			
2.2	Compute numerical quantities for Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal Distribution, Scatter Plots and Correlation Regression.	S2	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.3	Apply various mathematics rules, techniques in Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal Distribution, Scatter Plots and Correlation Regression.	S3	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.4	Solve mathematical problem using critical thinking in Descriptive and Inferential Statistics, Organizing Data, Measures of Central Tendency, Measures of Variation, Sample Spaces and Probability, Probability Distributions, Normal Distributions, Applications of the Normal Distribution, Scatter Plots and Correlation Regression.	S4	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
3.0	Values, autonomy, and responsibility			
3.1	Cultivate a mathematical attitude and nurture the interest.	V1	Group work, problem solving, web based work, Discussion	Assignments
3.2	Realize the importance of responsibilities through different modes of practice, competition and related activities.	V2	Group work, problem solving, web based work, Discussion	Assignments, Discussion
3.3	Inculcating values and ethics in thought, expression and deed.	V3	Group work, problem solving, web based work, Discussion	Assignments, Discussion

C. Course Content

No	List of Topics	Contact Hours
1.	Descriptive and Inferential Statistics, Variables and Types of Data, Data Collection and Sampling Techniques, Random Sampling, Systematic Sampling, Stratified Sampling, Cluster Sampling Other Sampling Methods, Observational and Experimental Studies.	6
2.	Organizing Data: Categorical Frequency Distributions Grouped Frequency Distributions, Histograms, Frequency Polygons and Ogive curve. Other Types of Graphs, The Pie Graph.	6
3	**Measures of Central Tendency:** The Mean, The Median, The Mode, The Midrange. **Measures of Variation:** Range, Population Variance and Standard Deviation, Sample Variance and Standard Deviation, Variance and Standard Deviation for Grouped Data, Coefficient of Variation.	6
4	**Sample Spaces and Probability:** Basic Concepts, Classical Probability, Complementary Events, Empirical Probability, Law of Large Numbers, Subjective Probability **The Addition Rules for Probability:** The Multiplication Rules and Conditional Probability.	9
5	**Probability Distributions,** Mean, Variance, Standard Deviation, and Expectation, The Binomial Distribution, Other Types of Distributions (Optional), The Poisson Distribution.	6
6	**Normal Distributions:** The Standard Normal Distribution, Finding Areas Under the Standard, Normal Distribution Curve, A Normal Distribution Curve as a, Probability Distribution Curve **Applications of the Normal Distribution:** Finding Data Values for given Specific Probabilities.	6
7	**Scatter Plots and Correlation** **Regression:** Line of Best Fit Determination of the Regression Line Equation.	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Home Assignment and Quiz	3	5%
2.	Mid Exam 1	6	20%
3.	Home Assignment and Quiz	10	5%
4	Mid Exam 2	12	20%
5	Final Exam	15	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	Bluman, A. G. (2014). Elementary Statistics a Step by Step Approach, 9th Edition, McGraw-Hill.
Supportive References	1. Web sites dedicated to Applied Statistics available on the internet. Larson, R. C. & Farber, E. (2012). 2. Elementary Statistics Picturing the World, 5th Edition, Prentice Hall / Pearson.
Electronic Materials	Web sites dedicated to Probability and Statistics on the internet.
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom equipped with projector, whiteboard, and sufficient seating arrangements.
Technology equipment (Projector, Smart board, Software)	Power point presentations and other hand-outs posted on the course web site.
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Peer and program leader	Indirect (Course Evaluation Survey)- Indirect peer evaluation
Effectiveness of students assessment	Students, Program assessment committee	Direct/ Indirect
Quality of learning resources	Students, Faculty members	Indirect
The extent to which CLOs have been achieved	Instructor	Direct/Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	**Board Of Mathematics Department**

REFERENCE NO.	**2**417
DATE	**29/03/1446 A. H.; 02/10/2024 A. D.**