Course Specification

(Bachelor)

Course Title:	**Principals of Statistics**
Course Code:	**STAT103-3**
Program:	**BSc in Data Science and Statistics**
Department:	**Mathematics**
College:	**Science**
Institution:	**Jazan University**
Version:	**1st**
Last Revision Date:	**26/3/2024**

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 2 / Year 1

4. Course general Description:

- Introduction (Definition of statistics).
- Collection, organization, and graphical representation of data.
- Measures of central tendency (mean, median, mode, midrange) for ungrouped and grouped data.
- Measures of variation (Range, variance, standard deviation) for ungrouped and grouped data.
- Measure of positions (Standard score, Percentile, Decile, Quartile, Box plot)
- Operations on sets.
- Counting methods (basic rules, multiplication rule, addition rule, permutation, and combination)
  Basic probability (random experiment, sample space, event, computation of probability, rules of addition and multiplication, conditional probability, Bayes' theorem), Random variables (variance and expected value, Binomial, and Poisson Distributions)
- Correlation and simple linear regression

5. Pre-requirements for this course (if any): None

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

7. Course Main Objective(s):

The student should know about the following topics when the course is over:

- Understand the fundamental concept of statistics, including its definition and its role in data analysis and decision-making processes.
- Develop skills in collecting, organizing, and representing data using various graphical techniques to effectively communicate information.
- Master the calculation and interpretation of measures of central tendency (mean, median, mode, midrange) for both ungrouped and grouped data sets.
- Gain proficiency in determining measures of variation (range, variance, standard deviation) for both ungrouped and grouped data, and understand their significance in describing the spread of data.
- Learn and apply measures of position (standard score, percentile, decile, quartile, box plot) to analyse the relative position of data points within a distribution.

- Acquire knowledge and skills in performing operations on sets, including union, intersection, and complement, and understand their application in statistical analysis.
- Develop a solid understanding of counting methods, including basic rules, multiplication rule, addition rule, permutations, and combinations, and apply them to solve probability problems. Additionally, grasp the concepts of basic probability, including random experiments, sample space, event, computation of probability, rules of addition and multiplication, conditional probability, and Bayes' theorem.
- Explore the concepts of correlation and simple linear regression, including the calculation and interpretation of correlation coefficients, and understand the use of regression analysis in modelling relationships between variables and making predictions.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	42	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	28
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	14
5.	Others (specify)	
	Total	42

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 the distinct characteristics of statistics compared to other fields of study and	K1	Lectures, Web based work,	Written exam (Problem solve, MCQ, Proof, Short

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	differentiate between various statistical concepts and terminology.		Classroom dissections.	answer), Quizzes, Assignments.
1.2	Identify different methods for collecting, organizing, and representing data and appropriate graphical representations for different types of datasets.	K2	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
1.3	Explain clear concepts and calculations involved in measures of central tendency, the significance and interpretation of measures of central tendency in descriptive statistics.	K3	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.0	Skills			
2.1	Apply methods for calculating measures of variation to analyze data spread and measures of position to interpret the relative position of data points within a distribution.	S1	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.2	Compute measures of position, including standard scores, percentiles, deciles, quartiles, construct box plots and measures of central tendency and variation for different datasets.	S2	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.3	Apply operations on sets, such as union, intersection, and complement, in statistical analysis, counting methods, including basic rules, multiplication rule, addition rule, permutations, and combinations, to solve probability problems.	S3	Lectures, Web based work, Classroom dissections.	Written exam (Problem solve, MCQ, Proof, Short answer), Quizzes, Assignments.
2.4	Solve problems involving statistical concepts, such as correlation and linear regression, to analyze	S4	Lectures, Web based work,	Written exam (Problem solve, MCQ, Proof, Short

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	relationships between variables and problems involving statistical concepts and techniques to make predictions and draw conclusions from data analysis.		Classroom dissections.	answer), Quizzes, Assignments.
3.0	Values, autonomy, and responsibility			
3.1	Cultivate an attitude towards data science and nurture the interest.	V1	Group work and interactive discussion.	Assignments, Discussion.
3.2	Realize the importance of responsibilities through different modes of practice, competition and related activities.	V2	Group work and interactive discussion.	Assignments, Discussion.
3.3	Inculcating values and ethics in thought, expression and deed.	V3	Group work and interactive discussion.	Assignments, Discussion.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction (Definition of statistics).	4
2.	Collection, organization, and graphical representation of data.	6
3	Measures of central tendency (mean, median, mode, midrange) for ungrouped and grouped data.	6
4	Measures of variation (Range, variance, standard deviation) for ungrouped and grouped data.	5
5	Measure of positions (Standard score, Percentile, Decile, Quartile, Box plot)	5
6	Operations on sets.	5
7	Counting methods (basic rules, multiplication rule, addition rule, permutation, and combination)	4
8	Basic probability (random experiment, sample space, event, computation of probability, rules of addition and multiplication, conditional probability, Bayes' theorem), Random variables (variance and expected value, Binomial, and Poisson Distributions)	7
Total		42

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework and Quiz	4	5%
2.	First Midterm Exam	8	20%
3.	Homework and Quiz	10	5%
4	Second Midterm Exam	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	• Elementary Statistics: A step by step Approach, Allan Bluman, 10th edition, McGraw Hill, 2017.
Supportive References	1. عدنان ماجد بري، د. محمود محمد هندي، د. أنور أحمد عبد الله : مبادئ الاحصاء والاحتمالات ،عمادة شؤون المكتبات (الطبعة الثانية 1415هـ) 2. Introduction to probability and Statistics, William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Duxbury Press, 2006. 3. Elementary Statistics: Picturing the World, Larson, R. C.& Farber, E. 3rdEdition, Prentice Hall, 2006.
Electronic Materials	Web sites dedicated to operation research available on the internet.
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom equipped with a projector, a whiteboard, and sufficient seating arrangements.
Technology equipment (Projector, Smart Board, Software)	PowerPoint presentations and other handouts 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 student 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.	**2306**
DATE	**../ …/1445 A. H.; …/02/2024 A. D.**