Course Specification
(Bachelor)

Course Title:	**Applied Statistics**
Course Code:	**453STAT-3**
Program:	**B. Sc. in Mathematics**
Department:	**Mathematics**
College:	**Science College**
Institution:	**Jazan University**
Version:	**2024**
Last Revision Date:	**9/2024**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:	03

2. Course type

A. University ☐ College ☐ Department ☒ Track☐ Others☐

B. Required ☒ Elective☐

3. Level/year at which this course is offered:

Level 7 / Year 4

4. Course general Description

This course is designed to provide students with

- Parametric estimation
- Hypotheses testing,
- Regression and correlation
- Chi-square tests
- Analysis of variances
- Nonparametric Statistics.

5. Pre-requirements for this course (if any): Stat 352

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:

- Application of statistics for solving different problems.
- Statistical methods for data analysis.
- Deep knowledge of statistics.
- Some software in Applied statistics.

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	**30**
2.	Laboratory/Studio	**30**
3.	Field	
4.	Tutorial	
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	Distinguish mathematical concepts relevant to Parametric estimation, Hypotheses testing, Regression and correlation, Chi-square tests, Analysis of variances, Nonparametric Statistics.	K1	Lectures, Web based work, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
1.2	Explain required notations and concepts in Parametric estimation, Hypotheses testing, Regression and correlation, Chi-square tests, Analysis of variances, Nonparametric Statistics.	K2	Lectures, Web based work, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
2.0	Skills			
2.1	Apply aspects relevant to Parametric estimation, Hypotheses testing, Regression and correlation, Chi-square tests, Analysis of variances, Nonparametric Statistics.	S1	Lectures, Web based work, Classroom discussions	Written exam (Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
2.2	Compute rates/quantities and Approximate Solutions in Parametric	S2	Lectures, Web based work,	Written exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	estimation, Hypotheses testing, Regression and correlation, Chi-square tests, Analysis of variances, Nonparametric Statistics..		Classroom discussions	(Problem solve, MCQ, true/false, Proof, Short answer), Quizzes, Assignments
2.3	Solve mathematical problems using critical thinking and problem solving in Parametric estimation, Hypotheses testing, Regression and correlation, Chi-square tests, Analysis of variances, Nonparametric Statistics.	S3	Lectures, Web based work, Classroom discussions	Written exam (Problem solve, MCQ, true/false, 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	Assignments, Discussion
3.2	Inculcating values and ethics in thought, expression and deed	V2	Group work, problem solving, web-based work	Assignments, Discussion

C. Course Content

No	List of Topics	Contact Hours
1.	**Parametric Estimation**: Point estimation, intervals estimation, maximum value of error in estimation, sample size estimation, confidence intervals estimation for population mean in large samples size (small sample size), confidence interval estimation for proportion of population, confidence intervals estimation for variance and standard deviation, confidence interval estimation for difference of two populations means in large samples size (small sample size), confidence intervals estimation for difference between two mean in dependent populations, confidence intervals estimation for difference of two proportions, confidence intervals estimation for ratios of two normal populations variances.	**6**
2.	**Hypotheses Testing**: Testing the population mean (large and small sample), testing the population proportion, testing the population variance or standard deviation, testing the difference between two means (large and small sample), testing the difference between two proportions, testing the ratio of two variances, testing the pair samples.	**6**
3	**Chi-Square Tests**: Chi-square test of goodness-of-fit, Chi-square tests of independence and homogeneity.	**5**

4	**Analysis of Variances**: One-way analysis of variances for fixed variables, complete random design analysis, two-way analysis of variances for fixed variables, complete randomize block design, two-way analysis of variance, the model of the impact of two factors and several levels and interaction between them.	**4**
5	**Regression and Correlation**: Statistical inference about regression factors, coefficient of association and coefficient of contingency, coefficient of determination, multiple linear regression, multiple and partial correlation, transformations in linear regression.	**4**
6	**Non-parametric Statistics**: Sign test, Wilcoxon signed rank test, Mann-Whiteny test, Kruskal-Wallis test, Run test.	**5**
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework and Quiz	3	5
2.	First exam	6	20
3.	Homework and Quiz	10	5
4	Second 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	Bluman, A. G. (2007). Elementary Statistics a Step by Step Approach, 7th Edition, McGraw-Hill.
Supportive References	- مبادئ الإحصاء و الاحتمالات تأليف د. عدنان بري وآخرون ، الطبعة الثالثة 1997م. - مفاهيم لطرق التحليل الإحصائي تأليف محمود هندي و خلف سلمان، مكتبة الرشد، الطبعة الثالثة 2007م. - الإسهام في الاحصاء التطبيقي تأليف د.نادر شعبان السواح, الدار الجامعية- الاسكندرية
Electronic Materials	Web sites dedicated to Applied Statistics available on the internet.
Other Learning Materials	Black board platform.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Computer Lab.

Items	Resources
Technology equipment (Projector, smart board, software)	Data show; Smart Board; Statistics Software

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	Instructor	Direct/Indirect
The extent to which CLOs have been achieved	Students, Faculty members	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.	**2417**
DATE	**29/03/1446 A. H.; 2/10/2024 A. D.**