Course Specification
(Bachelor)

Course Title:	Introduction to Biostatistics
Course Code:	STAT1251
Program:	Elective Natural and Social Sciences (GEE_S)
Department:	STATISTICS
College:	Science
Institution:	Tabuk University
Version:	1
Last Revision Date:	November 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3) (2lectures + 2 practical)					
2. Course type					
A.	☒ University	☐College	☐Department	☐Track	☐Others
B.	☐Required		☒ Elective		
3. Level/year at which this course is offered: (……)					
4. Course General Description:					
The course is concerned with the basics of biostatistics, including terms, measures, and their applications on bio data, such as measures of central tendency and dispersion, screening tests, probabilities, association measures, in addition to an introduction to statistical estimation and hypothesis testing					
5. Pre-requirements for this course (if any)**:**					
None					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course will provide insight to familiarize students with knowledge of: 1. Introduce students to the basic ideas of biostatistics and modeling approaches used in biological fields. 2. The course begins with an introduction to Biostatistics, focusing on descriptive methods for both categorical and numerical data. 3. This course provides an introduction to probability and the use of probability distributions in biostatistics. 4. Introduction: The fundamental concept of Random Sampling and Estimation. 5. Introduction to the concept of hypothesis testing. 6. This course provides an introduction to utilizing the statistical packages for biological examples, drawing from real-life studies published in biomedical and healthcare journals.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**60**	**60**
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 PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Describe basic biostatistics concepts and modeling approaches used in the biological field.	**K1**	**-lectures -lab lecture -Peer learing**	**- Midterm exam - Lab activities - Final exam -Lab final exam**
1.2	Recognize the statistical pakages environment, along with data entry and preparation.	**K2**		
2.0	**Skills**			
2.1	Calculate statistical measures for categorical and numeric Biological data as well as confidence intervals for means	**S1**	**-lectures -lab lectures -Peer learing - Discussion -Slove problems**	**- Midterm exam - Lab activities - Final exam -Lab final exam**
2.2	Examine ,measures of associations and correlation used in biostatistics as well as liner regression analysis.	**S2**		
2.3	Apply the conditional probability and probability distributions that are used in biostatistics.	**S3**		
2.4	Argue the statistical packages outputs for statistical techniques.	**S4**		
2.5	Investigate different types of probability and nonprobability samples	**S5**		
3.0	**Values, autonomy, and responsibility**			
3.1	Collaborate effectively as an individual or in a team on issues related to biostatistics and undertake lifelong learning.	**V2**	**-Cooperative learning and teamwork -Discussion -Self learning**	**-Oral presentation -Lab activities**

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Statistics: - Statistical and Critical Thinking. - Types of Data. - Collecting Sample Data.	4
2.	Exploring Data with Tables and Graphs: - Frequency Distributions for Organizing and Summarizing Data. - Histograms. **Application using statistical packages**	4
3.	Describing, Exploring, and Comparing Data: - Measures of Center. **Application using statistical packages**	4
4.	- Measures of Variation. **Application using statistical packages**	4
5.	Correlation: - Correlation. - Scatterplots, Correlation - **Application using statistical packages**	4
6.	Regression: - Regression. - Scatterplots, Regression - **Application using statistical packages**	4
7.	Probability: - Basic Concepts of Probability. - Addition Rule and Multiplication Rule. - Complements, Conditional Probability, and Bayes' Theorem	4
8.	- Risks and Odds. - Rates of Mortality, Fertility, and Morbidity. **Application using statistical packages**	4
9.	Discrete Probability Distributions: - Probability Distributions. - Binomial Probability Distributions. **Application using statistical packages**	4
10.	Normal Probability Distributions: - The Standard Normal Distribution. - Real Applications of Normal Distributions.	4
11.	- Sampling Distributions and Estimators. - Assessing Normality. **Application using statistical packages**	4
12.	Estimating Parameters and Determining Sample Sizes: - Estimating a Population Proportion. **Application using statistical packages**	4

13.	- Estimating a Population Mean. **Application using statistical packages**	**4**
14.	Hypothesis Testing: - Basics of Hypothesis Testing. - Testing a Claim About a Proportion. **Application using statistical packages**	**4**
15.	- Testing a Claim About a Mean. **Application using statistical packages**	**4**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	4th and 6th week	10%
2.	Midterm exam	8th week	20%
3.	Oral presentation	During semester	5%
4.	Lab activities	3rd – 14th week	15%
5.	Final lab Exam	15th week	10%
6	Final Exam	17th week	40%

*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	Marc M. Triola (2023) *Biostatistics for the Biological and Health Sciences*, John Person publisher . 3[3d] Edition, ISBN: 7576-9780137863792 https://www.pearson.com/en-us/subject-catalog/p/biostatistics-for-the-biological-and-health-sciences/P200000007576/9780137863792
Supportive References	Richard J. Rossi (2022) *Applied Biostatistics for the Health Sciences*, John Wiley & Sons, Inc. 2nd Edition, ISBN: 978-1-119-72270-0 https://www.wiley.com/en-gb/Applied+Biostatistics+for+the+Health+Sciences%2C+2nd+Edition-p- 9781119722700 Chap T. LE and Lynn E. Eberly (2016). *Introductory Biostatistics*; John Wiley & Sons, Inc., Hoboken, New Jersey; 1st edition. ISBN: 978-0-470-90540-1 https://www.wiley.com/en-us/Introductory+Biostatistics%2C+2nd+Edition-p-9780470905401 Babak Shahbaba (2013). *Biostatistics with R: An Introduction to Statistics Through Biological Data*; Springer; 2012th edition.
Electronic Materials	**https://publichealth.jhu.edu/departments/biostatistics/research-and-practice/resources** RStudio (additional libraries required): http://www.rstudio.com Quick-R http://www.statmethods.net/

Other Learning Materials	Daniel, W.W. and Cross, C.L., (2018) . *Biostatistics: a foundation for analysis in the health sciences*. Wiley; 11th edition

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom: capacity equal 40 students Computer Lab: capacity equal 25 students,
Technology equipment (projector, smart board, software)	Data show device
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching and assessment	- Faculty Member. - Peer Reviewers	- Exam questions correction. (Direct) - Homework correction. (Direct) - Course evaluation survey. (Indirect) - Analysis of course reports & student's results. (Indirect)
Extent of achievement of course learning outcomes	- Program administrators - Quality Assurance experts & Reviewers	Internal reviewing of the course contents, outcomes, reports & student's results. (Indirect)
Quality of learning resources	Program administrators	Questionnaires. (Indirect)
Other	-	-

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**DEPARTMENT COUNCIL**
REFERENCE NO.	**7**
DATE	**01/05/1445**