

Course Title:	Biostatistics I – Statistical Theory
Course Code:	BSTA-101
Semester:	I
Credit Hours:	03

Learning Outcomes

By the end of this course, students will be able to:

1. understand the key concepts of Biostatistics.
2. compute various summary statistics and make use of the graphical techniques to represent data we come across in health sciences.
3. acquire the basic knowledge of Regression and its applications.

Course Outline

Unit – I

1.1 Introduction to Biostatistics

Introduction to biostatistics. Variables and types of variables, Population and Sample, Scales of measurements. Sources of Health data in Pakistan. Descriptive and Inferential Statistics.

1.2 Presenting the data

Frequency distributions and graphical presentation of data, Stem and leaf displays, Box and Whisker diagrams, Histograms, Pie Charts, Bar Charts, Frequency Curves.

Unit – II

Descriptive Statistics

Averages and Dispersion Measures - Theory and Applications with reference to healthcare data: Arithmetic Mean, Median, Mode, Quantiles i.e. Quartiles, Deciles, and Percentiles, Absolute and Relative Measures of Dispersion; Range. Semi-Inter Quartile Range, Variance, Standard Deviation. Coefficient of Variation, Symmetry and Kurtosis.

Unit – III

Regression and Correlation Analysis

Simple Linear Regression: properties and Applications. Correlation and Causation, Correlation Coefficient: Pearson and Spearman.

Unit –IV

Categorical Variables and Measures

Categorical variables, Risk, Relative Risk, Odds, Odds Ratio.

- **Teaching-learning Strategies:**

Class Lecture method, which includes seminars, discussions, assignments and projects. (Audio-visual tools are used where necessary)

- **Assignments-Types and Number with calendar:**

According to the choice of respective teacher.

- **Assessment and Examinations:**

According to the University's Semester Rules.

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	It takes place at the mid-point of the semester.
2.	Formative Assessment	25%	It is continuous assessment. It includes: Classroom participation, attendance, assignments, and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

Textbooks:

1. Dawson, B., & Trapp, R. G. (2019). *Basic and Clinical Biostatistics* (5th ed.). McGraw Hill.
2. Glover, T., & Mitchell, K. (2015). *An introduction to biostatistics* (3rd ed.). Boston: McGraw-Hill.

Suggested Readings:

1. Daniel, W.W. (2018). *Biostatistics: A foundation for Analysis in the Health Sciences* (11th ed.). John Wiley and Sons, Inc. New York.
2. Le, C. T. (2009). *Health and numbers: a problems-based introduction to biostatistics* (3rd ed.). New York: Wiley-Liss.
3. Zar J. H. (2020). *Bio-statistical Analysis* (6th ed.). Pearson Education Indian Branch.