

Course Title:	Biostatistics II–Probability Theory
Course Code:	BSTA-103
Semester:	II
Credit Hours:	03

Learning Outcomes

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

1. learn the basic concepts of Probability and its related terminologies.
2. derive the probability function and properties of various discrete and continuous distributions.
3. grasp the knowledge of the practical applications of these distributions in the field of health/medical sciences.
4. learn the relationship between different distributions.

Course Outline

Unit – I

1.1 Introduction to Probability and its Basic Techniques

Basic Terminology used in Probability. Set theory, Classification of events.

1.1.1 Probability

Definitions of Probability. Independence of events, Conditional Probability, Baye’s rule.

Unit – II

2.1 Discrete Distributions

Discrete Random Variables, Probability Distribution, Mean and Variance of a discrete random variable. Bernoulli trials. Properties, applications and fitting of Binomial, Poisson, Hypergeometric, Negative Binomial and Geometric distributions with applications in the field of health sciences.

2.2 Continuous Distributions

Continuous Random Variable, probability density function and its properties. Normal Distribution and its properties, Standard Normal Curve, Normal approximation to Binomial and Poisson distributions. Exponential distribution. Central Limit Theorem, Approximation to distributions and real-world examples of these distribution in reference to Biostatistics.

- **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. Munro, B. H. (2012). *Statistical Methods for Health Care Research* (6th ed.). Lippincott, Philadelphia.
2. Walpole, R. E., Myers, R. H., Myers, S, L. & Ye, K. (2016). *Probability and Statistics for Engineers and Scientists* (9th ed.). Prentice Hall, New York.

Suggested Readings:

1. Fowler, J., Cohen, L. & Jarvis, P. (2018). *Practical Statistics for Field Biology* (2nd ed.). John Wiley and Sons, New York.
2. Lehman, E. L., & Casella, G. (2019). *Theory of Point estimation* (4th ed.). Springer, New York.