PROBABILITY DISTRIBUTTIONS

Credits: 4 **Semester:II**
Subject Code: BS22211 **No. of Lecture Hours: 75**

Objectives: To prepare students for lifelong learning and successful careers using their statistical skills. Statistical information covers different subject areas (economic, demographic, social etc.). It provides basic information for decision making, evaluations and assessments at different levels.

Outcome: Students will be able to apply

CO1: Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions

CO2: Identify the characteristics of different discrete distributions.

CO3: Apply the normal probability distribution including standard normal curve calculations of appropriate areas.

CO4: Choose exponential, beta and Gamma distributions to solve statistical problems.

CO5: Develop different distributions to solve various statistical problems.

UNIT-I **15hrs**

Discrete Distributions - I:

Uniform, Bernoulli	2
Binomial and Poisson distributions – Properties of these distributions	3
(such as m.g.f., c.g.f, and p.g.f, characteristic function.)	3
moments up to fourth order and their real-life applications	2
Reproductive property wherever it exists	2
Poisson approximation to Binomial distributions	3

UNIT-II **15hrs**

Discrete Distributions - II:

Negative Binomial	4
Geometric and Hyper	
Geometric (mean and variance only) distributions.	4
Properties of these distributions such as m.g.f., c.g.f, and p.g.f, characteristic function,	
Moments up to fourth order and their real-life applications	
Reproductive property wherever it exists	2
Binomial approximation to Hyper-Geometric	3
Poisson approximation to negative Binomial distributions.	2

UNIT-III **15hrs**

Continuous distributions - I:

Rectangular and Normal distributions	4
Normal distribution as limiting case of Binomial and Poisson distributions	3
Properties of these distributions such as m.g.f., c.g.f, and characteristic function	3

Moments up to fourth order and their real life applications	3
Reproductive property wherever it exists	2

UNIT-IV **15hrs**

Continuous distributions - II:

Exponential, Gamma	6
Beta of two kinds: definitions, mean and variance	3
Properties of these distributions such as m.g.f., c.g.f, and characteristic function moments up to fourth order and their real-life applications	3
Reproductive property wherever it exists.	3

UNIT-V **15hrs**

Exact sampling distributions	3
Statement and properties of χ	2
Mean variance and additiove propery of χ^2	2
Statement and properties of t	3
Mean variance and MGF of t	1
Statement and properties of F	2
Mean variance and additive property of F	1
Interrelationships between t and F and F and χ^2	2