

**GUJARAT UNIVERSITY**  
**B. COM. (HONS)**  
**SEMESTER –II**  
**PROBABILITY THEORY (MAJOR)**  
**COURSE CODE: DSC-C STA 121**  
**CREDIT MARK DISTRIBUTION – 04**  
**AS PER NEP 2020 (To be effective from June 2023)**

**Lecture 04 Hours**

**Tutorial – 00**

**Practicum – 00**

**1. Course Code & Title**

<b>Course Title : Bachelor of Commerce</b>	
<b>Course Code : DSC-C STA 121</b>	<b>No. of Credits : 04</b>

**2. Course Overview & Course Objectives**

<p><b>Course Overview/ Course Description</b>  This course offers students the knowledge about basics of methods of probability. This knowledge is necessary for the students who are opting statistics subject and for the professional and advanced studies this course will be very advantageous.</p>
<p><b>Course Objectives</b></p> <ol style="list-style-type: none"> <li>1. To make them familiar with the basics of the probability theory.</li> <li>2. To give basic knowledge of tool requires for analyzing the probability distributions.</li> <li>3. To make them aware of importance of probability mass functions.</li> <li>4. To make students familiar with various types of distribution functions and their applications.</li> </ol>

**3. Course Content**

Unit	Topics	Content/ Fundamental Concepts	Unit Wise SLO
1.	<b>Probability Theory</b>	<p><b>A. IKS</b>  Definition of Factorial (Patiganita of Sridhar). The theory of Permutations and Combinations. (433-357 BCE by Bhadrabahu). The Game of Dice. Gambling in Mahabharat.</p> <p><b>B.</b> Introduction and definition of random experiment, sample space, different types of events, Mathematical, statistical and axiomatic definitions of probability with their limitations,</p>	<p>Appreciative approach to measure uncertainty or randomness in the occurrence of any event and to use it for the problems of real life problems.</p>

		Types of probability - classical, relative, subjective- , Addition and multiplication rules of probability and other corollaries of it, conditional probability, numerical examples based on all these concepts, Bayes' theorem (without proof) and its application up to three events and simple numerical examples based on it.	
2.	<b>Mathematical Expectation and Moments:</b>	Meaning and definition of random variable and its type, Definition of probability distribution of random variable, Definition of mathematical expectation of discrete random variable and its properties (without proof), Simple applied examples on mathematical expectation Definition of variance, covariance and its properties. Simple examples based on it. Meaning and definition of Raw and Central moment and its uses Relation between first four raw and central moments (without proof), Concept of coefficient of Skewness and Kurtosis and their interpretations, Simple examples for obtaining the measures by using raw data, grouped data and probability distribution.	Extending the knowledge of probability, to have statistical analysis when probabilities or probability distribution function of random variable is known.
3.	<b>Discrete Probability Distributions -1</b>	Meaning and definition of probability distributions and distribution function of random variable, Probability mass function of Binomial distribution, its properties and applications, application base numerical examples. Probability mass function of Poisson distribution, properties, applications and simple application base examples. (Mathematical proofs are ignored in all distribution).	For determining probability in the case of dichotomous outcomes and for the rare events such distributions are used to find probability.
4.	<b>Discrete Probability Distributions -2</b>	Meaning and definition of probability mass function of Hyper-geometric distribution, properties, its comparison with Binomial distribution and simple applications based numeric examples on it. Meaning and definition of Probability mass function of Negative Binomial distribution Its properties and applications, Numerical examples.	For determining probability in easy and simple manner, familiarity with various types of distributions is to be studied.

		Meaning and definition of probability mass function of Geometric distribution, simple applications and their properties and simple examples based on application. (Mathematical proofs are ignored in all distribution).	
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#### 4. Course Learning Outcomes/Students' Learning Outcomes (SLO)

Course Learning Outcomes
<ol style="list-style-type: none"> <li>1. This course helps to measure uncertainty or randomness in the occurrence of any event and to use it for the problems of real life problems.</li> <li>2. This course gives idea of the statistical analysis when probabilities or probability distribution function of random variable is known.</li> <li>3. Learning to determining probability in the case of dichotomous outcomes and for the rare events such distributions are used to find probability.</li> <li>4. Attaining knowledge of determining probability in easy and simple manner, familiarity with various types of distributions are to be studied.</li> </ol>

#### 5. MODE OF EVALUATION

Evaluation will be divided in two parts:

- **Semester End Evaluation (SEE):** Semester End Examination will be conducted by the Gujarat University of 50 Marks
- **Continuous and Comprehensive Evaluation (CCE):** Continuous and Comprehensive Evaluation of 50 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time

#### 6. Recommended learning Resources

- Levin and Rubin: "Statistics for Management", Prentice Hall of India Pvt. Ltd. New Delhi
- Sancheti & Kapoor: Business Statistics. Sultan Chand & Sons, New Delhi
- Sancheti & Kapoor: Business Mathematics, Sultan Chand Sons, New Delhi..
- S. C. Gupta, V. K. Kapoor, Fundamentals of Applied Statistics, Sultan Chand & sons, New Delhi.
- S.C. Gupta: "Fundamentals of Mathematica Statistics" S. Chand, New Delhi.

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