

**Course: VEC**  
**Basics of Data Analytics**

<b>Semester: II</b>	<b>Credits: 2</b>	<b>Subject Code: BSVECBDA2301</b>	<b>Lectures: 60</b>
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**Course Outcomes:**

At the end of the course the learner will be able to:

- CO1 - Apply methods of Counting Principles, Permutation, and Combination to real life situations. Apply concepts of experiments, sample space, events required in the calculation of probabilities.
- CO2 - Use the basic probability rules, including additive and multiplicative laws, independent and mutually exclusive events, in problem solving.
- CO3 - Understand and apply concepts of conditional probabilities and independence of random variables.
- CO4 - Apply discrete probability distributions to various real life problems.

**Unit 1: Theory of probability**

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- Assignments based on Counting Principles, Permutation, and Combination.
- To understand the concept of Deterministic and non-determination models, Random Experiment, Sample Spaces (Discrete and continuous) and use them in problem solving.
- To learn the concept of Events: Types of events, Operations on events. Assignments based on them.
- Problem solving based on understanding and learning the concepts of Probability - classical definition, probability models, axioms of probability, Probability of an event. Assignments based on Theorems of probability.
- To learn and understand Concepts and definitions of conditional probability, multiplication theorem  $P(A \cap B) = P(A) \cdot P(B|A)$  and solve numerical problems using them.
- To learn and understand the concept and definition of independence of two events. Numerical problems related to real life situations.

**Unit 2: Random variable, Standard Discrete Distributions**

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- Assignments based on definition of discrete random variables and probability mass function (p.m.f.) of discrete random variables, Cumulative distribution function (c.d.f.) of discrete random variables and their properties. (Characteristic properties only).
- Assignments based on understanding of expectation and variance of discrete random variables, theorems on expectation and variance, Determination of median and mode using p.m.f. only.
- To learn Uniform Distribution: definition, mean, variance and problem solving using the same.
- Assignments based on Binomial Distribution: definition, mean, variance, additive property, Bernoulli distribution as a particular case with  $n = 1$ . Illustration of real life situations.



<b>Board of Studies</b>	<b>Department</b>	<b>Name</b>	<b>Signature</b>
Chairperson (HoD)	BSc(Comp. Sci)	Anjali Kale	<i>[Handwritten Signature]</i> 3/6/23

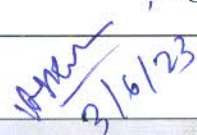
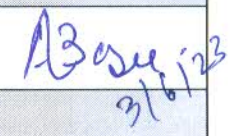
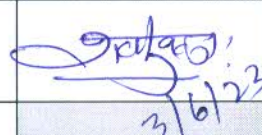
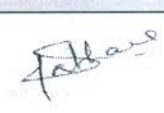
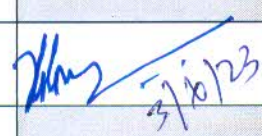
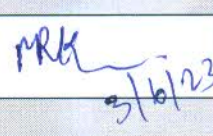
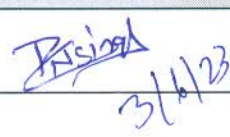
- Assignments based on Poisson Distribution: definition, mean, variance, mode, additive property, limiting case of  $B(n, p)$ . Illustration of real life situations.
- Study of free statistical softwares and writing a report on it. (individual activity)

#### Recommended Text Books:

- Kulkarni M.B., Ghatpande S.B., Gore S.D. 1999, Common Statistical Tests, Satyajet Prakashan, Pune
- Kulkarni M.B., Ghatpande S.B. 2007, Introduction to Discrete Probability and Probability Distributions SIPF Academy
- Sarma K.V.S. 2001 *Statistics Made Simple. Do it Yourself on P.C.* Prentice Hal

#### Reference Books:

- Agarwal B. L., *Programmed Statistics*, New Age International Publishers.
- Freund J.E., *Modern Elementary Statistics*, Pearson Publication, 2005.
- George W. Snedecor, William G. Cochran, *Statistical Methods*, John Wiley & sons
- Kennedy and Gentle, *An Introductory Statistics*.
- Kulkarni M.B., Ghatpande S.B., *Introduction to Discrete Probability and Probability Distributions*, SIPF Academy, 2007.
- Medhi J., *Statistical Methods (An Introductory Text)*, New Age International, 1992.
- Mukhopadhyay P. *Mathematical Statistics (3rd Edition)*, Books And Allied (P), Ltd 2015.
- Probability, Statistics, *Design of Experiments and Queuing Theory with Applications of Computer Science*, Trivedi K.S., Prentice Hall of India, New Delhi 2001.
- Sheldon Ross, *A First course in Probability*, Pearson Education Inc.

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