DSM121 Probability Theory & Probability Distributions

Semester: II	Course Title: Probability Theory & Probability Distribution	Credit: 4
Course Code: DSM121		(3 T + 1 P)

CourseOutcomes:Onsuccessfulcompletionofthecoursethelearnerwillbeableto

CO	COGNITIVEABILITIES	COURSEOUTCOMES
CO 1	REMEMBERING	Recall the principle of counting, and describe random and non-random experiments.
CO 2	UNDERSTANDING	Understand basic concepts of probability. Create sample space for random experiments and identify the events and their types. Understand the types of random variables and their probability distributions.
CO 3	APPLYING	Apply the theory of probability to various real-life situations to find the probabilities of different types of events. Apply various probability distributions to real-life situations.
CO 4	ANALYSING	Explain the definition of independence of events, the concept of conditional probability, and Bayes' theorem.
CO 5	EVALUATING	Justify the random variables in a given situation and find the probability distribution.
CO 6	CREATING	Develop the skill to interpret probability results.

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	1	-	-
CO 2	1	1	-	2	-
CO 3	1	2	3	-	-
CO 4	2	1	2	2	1
CO 5	1	1	-	1	-
CO 6	1	1	2	3	1

Unit	Detailed Syllabus	Teaching Hours
I	**Introduction to Probability** Random Experiment, trial, sample point, sample space, definitions of equally likely, mutually exclusive, and exhaustive events. Definition of probability: classical, relative, and axiomatic approach and its properties. Conditional probability, multiplicative law of probability. Independence of events, law of total probability, Bayes theorem and its applications.	15
II	**Random Variables (Univariate & Bivariate)** Random Variable (rv) with its types, probability mass function (pmf), probability density function (pdf), cumulative distribution function (cdf) with illustrations. Concept of Joint Distributions, Joint probability mass function, and Joint probability density function. Marginal and conditional distributions, independence of random variables. **Mathematical Expectation**	15

	The expectation of Random variables with properties, Expectation of a function of a random variable. Measures of location, dispersion, skewness, and kurtosis.	
III	**Discrete Probability Distributions** Discrete Uniform, Bernoulli's, Binomial, Poisson, Geometric, and Negative Binomial distributions and their properties **Continuous Probability Distributions** Rectangular, Exponential, and Normal distributions and their properties.	15
IV	**Practical Component Based on R Programming** • Computation of probability and conditional probability. • Applications of Bayes' Theorem • Construction of univariate and Bivariate probability distributions. • Construction of marginal and conditional probability distributions. • Generate a random sample from Binomial, Poisson, Geometric, and Negative-Binomial distributions. • Generate a random sample from rectangular, exponential, and normal distributions. • Fitting of Binomial distribution. Fitting of Poisson distribution. • Fitting of Exponential distribution. Fitting of Normal distribution.	15

Suggested Reference Books:

1. Introduction to the Practice of Statistics, Moore, S. David; McCabe, P. George W. H. Freeman and Company, New York.
2. Basic Statistics, Agarwal, B. L., New Age International (P) Ltd.
3. Introduction to the theory of Statistics, Mood, A. M., Greybill, F.A., Boes, D.C., Mc Graw Hill.
4. Fundamentals of Mathematical Statistics, S. C. Gupta and V. K. Kapoor, Sultan Chand and Sons, New Delhi.
5. Mathematical Statistics, P. Mukhopadhyay, New Central Book Agency (P) Ltd, Calcutta
6. An Introduction to Probability and Statistics, V. K. Rohatgi and A.K.Md. Ehsanes Saleh, Wiley Series.

DSM122 Database Management System

Semester: II	**Course Title: Database Management System**	**Credit: 4**
Course No.: DSM122		**(3 T + 1 P)**

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVEABILITIES	COURSEOUTCOMES
CO 1	REMEMBERING	Describe the basic concepts and components of a database system.
CO 2	UNDERSTANDING	Explain relational models, schemas, and normalization techniques.
CO 3	APPLYING	Design entity-relationship models and convert them into relational schemas.
CO 4	ANALYSING	Analyze SQL queries and optimize database performance.
CO 5	EVALUATING	Evaluate concurrency control, transaction management, and