COURSE TITLE	**INTRODUCTION TO PROBABILITY THEORY**
COURSE CODE	**05DS0302**
COURSE CREDITS	**4**

Course Outcomes: After completion of this course, student will be able to:

1. Develop expertise in a standard set of statistical and graphical techniques useful in analyzing business related data.
2. Apply appropriate measure of central values and variability to analyze data.
3. Understand the mathematical basis of probability and its applications in various fields of real life.
4. Apply various Probability Distributions in analyzing Data and solving Decision Making Problems.
5. Apply appropriate Sampling Technique in Choosing a Representative Sample from a Population and Examine the Population Parameters using Estimation Techniques.

Pre-requisite of course: Introduction to Probability Theory.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Permutations and Combinations :** Fundamental Principle of Counting, Examples, Permutations with and without repetitions, Examples , Circular permutations, Examples , Combinations, Examples , Practical problems on permutations and combinations, Examples	10
2	**Basic Probability :** Experiment,definition of probability, conditional probability, Independent events, Bayes' rule, Bernoulli trials, Random variables, Discrete random variable, Continuous random variable, probability density function, cumulative distribution function, properties of cumulative distribution function, Two dimensional random variables and their distribution functions, Marginal probability, Independent random variables	10
3	**Discrete Probability Distribution :** Random Variables and Mathematical Expectation (Mean and Variance), Examples, Discrete and Continuous Variables, Examples, Binomial Distribution, Examples, Poisson Distribution, Examples	10

Contents : Unit	Topics	Contact Hours
4	**Continuous Probability Distribution :** Uniform Distribution, Examples, Normal Distribution, Examples, Exponential Distribution, Examples, Exponential Distribution – Applications, Examples	10
5	**Sampling Distribution :** Population, Parameter, Sample, Statistic, Types of Sampling Methods – Simple Random Sampling (SRS), Stratified Sampling and Cluster Sampling, Point Estimation, Sampling Distribution of Sample Mean, Relationship between Sample Size, Sampling Distribution	10
Total Hours		**50**

Textbook :

1 Statistics for Business and Economics, Anderson et al, Cengage, 10ED

2 Statistical Methods, S P Gupta, Sultan Chand and Sons, .

References:

1 Practical Statistics for Data Scientist, Practical Statistics for Data Scientist, Peter Bruce and Andrew Bruce, O'RELLY, 2017

2 Introduction to Statistics and Data Analysis, Introduction to Statistics and Data Analysis, Christian Heumann, Shalabh Sinha et al, Springer, 2017

3 Fundamentals of Mathematical Statistics, Fundamentals of Mathematical Statistics, S C Gupta and V K Kapoor, Sultan Chand and Sons, 2020

4 Excel Basics in 30 Minutes – The quick guide to Microsoft Excel and Google Sheets, Excel Basics in 30 Minutes – The quick guide to Microsoft Excel and Google Sheets, Ian Lamont, i30 Media Corporation, 2ndE

5 BUSINESS STATISTICS for Contemporary Decision Making, BUSINESS STATISTICS for Contemporary Decision Making, Ken Black, John Wiley and Sons, 6thE

6 Fundamentals of Statistics, Fundamentals of Statistics, S.C. Gupta, Himalaya Publishing House PVT. LTD., .

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
20.00	30.00	25.00	15.00	10.00	

Instructional Method:

1 VIDEO

Instructional Method:

2 PPT

3 DEMO

Supplementary Resources:

1 https://www.coursera.org/courses?query=statistical%20analysis

2 https://www.edx.org/learn/statistics