COURSE TITLE	**STATISTICS & COMPUTATIONAL DATA ANALYTICS**
COURSE CODE	**04BA0301**
COURSE CREDITS	**3**

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

1. Describe and present data using appropriate graphical and numerical statistical tools to summarize key characteristics
2. Apply basic probability concepts to solve real-life problems under uncertainty.
3. Perform hypothesis tests for means, proportions, and variances, and interpret the statistical significance of the results.
4. Construct and interpret confidence intervals and conduct one-way ANOVA to compare group means.
5. Analyze relationships using correlation and regression and understand their practical applications.

Pre-requisite of course: None

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Introduction to Statistics and Data Representation** Importance of statistics in business, Types of data: qualitative vs quantitative, Sampling methods and survey types, Data representation: tables, bar charts, pie charts, histograms, Measures of central tendency: mean, median, mode, Measures of dispersion: range, variance, standard deviation, Shape of distribution: skewness, kurtosis, Introduction to Excel for statistical functions	8
2	**Fundamentals of Probability and Discrete Distributions** Introduction to probability, Experiments, sample space, and events, Laws of probability: addition and multiplicationConditional probability and independence,, Bayes' Theorem (basic understanding), Discrete distributions: Binomial and Poisson, Real-life applications and Excel-based illustrations	10
3	**Basics of Hypothesis Testing** Concept of hypothesis testing, Null and alternative hypotheses, Type I and Type II errors, , z-test and t-test for single mean, p-values and confidence levels, Step-by-step hypothesis testing in Excel, Introduction to variance testing	9

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Contents : Unit	Topics	Contact Hours
4	**Comparative Analysis using Two-Sample Tests and ANOVA** Independent sample t-tests, Dependent sample t test, One-Way ANOVA: application and procedure, Interpretation of results using Excel outputs	9
5	**Correlation and Regression Analysis** Pearson's correlation coefficient, Simple linear regression: equation, interpretation , and scatterplots, Regression line and coefficient of determination (R^2), Residual analysis and its significance, , Hypothesis testing for regression slope	9
Total Hours		**45**

Textbook :

1 Business statistics: For contemporary decision making (11th ed.)., Black, K. . , Wiley., 2023

2 Business Statistics, , Naval Bajpai, , Pearson, , 2020

References:

1 Business Statistics, , Business Statistics, , J K Sharma,, Vikas Publishing, 2020

2 Statistics for Management,, Statistics for Management,, T N Srivastava and Shailaja Rego, TMH, , 2020

3 M.S. Excel Tools for Managers,, M.S. Excel Tools for Managers,, D P Apte, , Excel, 2020

4 Mathematics and Statistics for Management,, Mathematics and Statistics for Management,, K. B. Akhilesh& S. B. Balasubrahmanyam,, Vikas, , 2020

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 / Creative
0.00	0.00	35.00	35.00	30.00	0.00

Instructional Method:

1 Classroom Teaching

Supplementary Resources:

1 https://www.britannica.com/science/statistics/Random-variables-and-probability-distributions

2 https://machinelearningmastery.com/statistical-hypothesis-tests/

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Supplementary Resources:

3 https://www.questionpro.com/features/correlation-analysis.html

4 https://www.sciencedirect.com/topics/medicine-and-dentistry/regression-analysis

5 https://www.aptech.com/blog/introduction-to-the-fundamentals-of-time-series-data-and-analysis/

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