

Paper Code: CS36.11

Course Objective:

- **Decision Making:** Business and Data intelligence provides accurate and relevant information to support effective decision-making.
- **Performance Optimization:** Another objective of business and data intelligence is to optimize overall business performance.
- **Competitive Advantages:** Business and data Intelligence can help students gain a competitive edge.
- **Risk Management:** Managing risks is crucial for businesses, and data intelligence plays a significant role in this aspect.
- **Customer Understanding and Satisfaction:** Understanding customers' performances, needs, and behaviors is vital for business and data intelligence.

Course Outcomes (COs)

After completing this course, the students will be able to:

- **CO1:** Identify and classify data types, variables, measurement scales, and probability distributions relevant to business data.
- **CO2:** Apply methods for handling missing data and perform data preparation for analysis.
- **CO3:** Design and interpret meaningful visualizations using charts, plots, and dashboards for business reporting.
- **CO4:** Develop dashboards using tools such as Tableau, Power BI, and Advanced Excel, including pivot tables.
- **CO5:** Perform descriptive statistical analysis using measures of central tendency, dispersion, correlation, and hypothesis testing.
- **CO6:** Apply regression, classification, clustering, and dimensionality reduction techniques for business analytics tasks.
- **CO7:** Implement visualization and analytics tasks using R, including ggplot2, PCA, and cluster visualization.

UNIT	Contents
1	Data Definition and Analysis Techniques: Data Elements, Variables, and Data Classification, Levels of Measurement, Some important probability distributions, Handling Missing data and its type.
2	Data Visualization and Business Intelligence: Data visualization, different types of visualization: Scatterplot, line graph, Bar chart, Pie Chart, Boxplot, etc.; Introduction to Dashboard and Dashboard Design, Visualization Tools: (Tableau, Advanced Excel, Power-BI); Pivot table in Excel, visualization using Power BI/Tableau/Advanced Excel
3	Descriptive Statistics & Basic Data Analysis Techniques: Introduction to statistical learning: Measures of Central Tendency and Dispersion, Correlation Coefficients, ANOVA, Parametric non-parametric tests, Maximum Likelihood Test. Linear Algebra: Matrix and determinants, Eigen values, Eigen vectors and Diagonalization.
4	Data Analytics Techniques: Regression Analysis (linear Regression, Logistic Regression), Classification techniques :(Decision Tree, Ensemble (Bagging and Boosting)), Clustering: (K-mean), Dimension Reduction (PCA).
5	Practice and analysis with R: Elements of programming Language R, Basics of GGplot2, Geom functions, Mapping and aesthetics (aes()), Perform and plot PCA data using iris, Stat Transformations: Bar plots, box plots, and histograms, Visualizing clusters with heatmaps.

References and Books

1. Business unintelligence: Insight and Innovation beyond Analytics and Big Data, Kindle Edition, Barry Devlin.
2. The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition, Trevor Hastie, Robert Tibshirani, and Jerome Friedman, Springer 2014.
3. Machine Learning: An Artificial Intelligence Approach Book by Tom M Mitchell
4. Businessinformaticsmcaiipresentation.zip