KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam - 625 701 (Near VIRUDHUNAGAR)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Value Added Course

on

"DATA ANALYTICS AND VISUALIZATION USING POWER BI"

31-07-2023 to 05-08-2023

OBJECTIVES:

To enable the students to

- Build the data model for real-world applications with visualization reports.
- Create an interactive dashboard with multiple worksheets.
- Apply the knowledge of grouping and clustering to real-world applications.
- Design the regression models with filters and prediction methods.
- Understand the BI DAX commands and functions

Unit 1 Data Visualization

Connecting Power BI to a Data File - CSV File - Navigating Power BI - Drilling down and up in hierarchies - Advanced drilling in hierarchies - Adding Colors - Adding A Calculated Column - Adding Labels and Formatting. **Power BI - Data Visualization** - Data Visualization - Introduction to Visualization - Line Plots and Bar Charts - Pie Chart and Histogram - Scatter Plots and Parallel Coordinates - Advanced Plotting - Exporting Plots and Other Plotting Packages Bar chart-Connecting Power BI to a Data File - CSV File-Navigating Power BI - Creating Calculated Fields - Adding Colors-Adding Labels and Formatting - Exporting Your Worksheet - Time series, Aggregation, and Filters. **Power BI - Time series and Aggregation and Filters** - Downloading and connecting to the dataset - Working with time series - Understanding aggregation and granularity - Creating an area chart & learning about highlighting - Filters and Slicers. **Power BI Dashboard Creation** - Joining Data - Creating a Map, Working with Hierarchies - Joining Dashboard Advanced Dashboard Interactivity

Unit 2 Dashboard and Story Line Creation

Power BI Storyline Creation - Joining and Blending Data, PLUS: Dual Axis Charts-Creating Bins - Tree Map Chart-Customer Segmentation Creating a Storyline - Creating a Map, Working with Hierarchies - Creating a Scatter Plot, Applying Filters to Multiple Worksheets - Let's Create our First Dashboard! - Adding an Interactive Action using Filter **Power BI - Maps, Scatterplot and Interactive Dashboard** - Joining data in Power BI - Understanding how LEFT, RIGHT, INNER, and OUTER joins work - Joins with duplicate values - Joining on multiple fields - Creating a map, working with hierarchies, lats and lons - Power BI: Calculated Columns vs Calculated Measures - Creating a scatter plot - Combining charts, filters and slicers - Adding a Donut Chart. **Power BI - Creating an Interactive Power BI Dashboard** - Mapping: How to Set Geographical Roles - Creating Table Calculations for Gender - Creating Bins and Distributions for Age - Creating Bins and Distributions for Balance - How to create a Tree map chart - Creating a Customer Segmentation Dashboard - Controlling Report Interactivity - Analyzing the Customer - Segmentation Dashboard

Unit 3 Grouping and Clustering

Power BI - Advanced Data Preparation - What Format Your Data Should Be In - Data Interpreter and Pivot - Splitting a Column into Multiple Columns - Metadata Grid - Fixing Geographical Data Errors in Power BI - Hierarchical Clustering Using Power BI Software and K-Mean Clustering Using Power BI Software. **Power BI - Creating Custom Territories via Grouping –** Un Grouping and Comparison of Region - Creating custom Territories via Geographical Roles - Adding Highlighters using Details Box and Legends - Joining and Blending Data, PLUS: Dual Axis Charts - Understanding how LEFT, RIGHT, INNER, and OUTER Joins Work - Joins with Duplicate Values - Joining on Multiple Fields - The Showdown: Joining Data vs. Blending Data in Power BI - Data Blending in Power BI and Dual Axis Chart - Creating Calculated Fields in a Blend (Advanced Topic). **Cluster Analysis using Power BI** - Cluster Analysis Introduction - Statistics associated with Cluster Analysis - Conducting Cluster Analysis - Classification of Clustering Procedure - Hierarchical Clustering - Non Hierarchical Clustering - Clustering In Power BI and Cross-Database Joins - Modelling With Clusters - Saving Your Clusters - New Design Features and New Mobile Features

Unit 4 Regression, Group and Sets

Power BI and SQL Integration - Get all your data into SQL Server - Connect Power BI to SQL Server - Create a new report in Power BI Desktop - Publish the Report to the Power BI Service - Configure the dataset settings - Configure the refresh interval - Ensure the data is up to date – Summary. Power BI Front End Application Development - Multiple Sheets - Data Interpreters - Merge Mismatched Fields - Applying the filters in Data Source - Step Up Charts - Jump Up Charts - County - Mapping Layers - ToolTip Dashboard. **Power BI Prediction Algorithm-** Linear Regression Analysis - Formulation of Regression Model - Bivariate Regression - Statistics Associated with Bivariate Regression Analysis - Conducting Bivariate Regression Analysis - Multiple Regressions - Conducting Multiple Regression - Mapping Bivariate Regression with Real Time Example

Unit 5 Data Analytics

Power BI - Leveraging Custom Visuals –The Challenge: Visualizing the European Debt Crisis - Installing a Custom Visual for Power BI - Mechanics of a Chord Chart - Setting up the second Chord Chart - Adding Tree maps. **POWER BI integrated with Data Analytics Expressions** - Data Analytics Expressions 101 - DAX vs. M Languages - Intro to DAX Calculated Columns - Intro to DAX Measures - Implicit vs. Explicit Measures - RECAP: Calculated Columns vs. Measures - PRO TIP: Dedicated Measure Tables - Understanding Filter Context - DAX Syntax & Operators - Common DAX Function Categories - Basic Math & Stats Functions - Counting Functions. **Power BI Integrated with SQL Database** - Why Combining SQL and Power BI is useful.

Total: 45 Hours

OUTCOMES:

Upon successful completion of the course, students will be able to

CO1: Design a data model by using Power BI desktop layouts, BI reports, and dashboards

CO2: Infer the knowledge for competing edge in creating customized visuals and deliver a reliable analysis of vast amount of data using Power BI

CO3: Apply suitable classification and clustering algorithms for an application

CO4: Build the regression models to real time applications

CO5: Learn how to experiment, fix, prepare and present data quickly and easily