Data Analytics & Visualization (Powered by Tableau) - Course Content

Course objectives and learning outcomes

1. **Course objectives:** The main objectives of the course is to prepare the students to become skillful by doing hands on project based learning in the real time environment. Also making them to become industry /job - ready

2. **Course outcomes:** To gain hands on working skills and industry project experience by learning & Hands-on-with Tableau Platform,Data Extraction using Database & Flat files,Working with Metadata and Data Blending,Working with Filters,Organizing Data & Visual Analytics,Working WIth Mapping ,Calculations,Expressions & Parameters,Use the Tableau Analytics interface/paradigm to create powerful Visualizations, Dashboards & Story effectively,Represent data using various visualization types,Build a web application using flask web framework & Build a number of use cases in multiple domains such as Financial Services, Insurance, Retail, Ecommerce, Telecom, Agriculture, Aviation etc.

3. **Prerequisite:**
   Skills Required: Basic Knowledge of Data Analysis & Database
   System Requirement:
   Hardware Requirements: 4GB RAM,Processor- Intel core i3/M1 OS-Windows/Linux/MAC
   Software Requirements: Tableau,MySQL Workbench,Spyder/VsCode (IDE)

Module	Session duration	Session/Module Name	Topics
1	3 Hours	Introduction to Business Intelligence	Business Intelligence Data Integration Data Processing Data Presentation ETL Architecture Introduction to Data Analytics. Types of Data Analytics. Descriptive Analytics Diagnostic Analytics Predictive Analytics Prescriptive Analytics Analytics & Applications
2	2 Hours	Introduction to Tableau	Introduction to tableau Overview & Features Connecting Tableau to Data Sources Working with Flat files Connecting spreadsheets
3	3 Hours	Data Extraction	Introduction to Database Creating Database & Table CRUD Operation on database tables Basic SQL Operations
4	1 Hour	Architecture of Tableau	Architecture of Tableau Interface of Tableau (Layout, Toolbars, Data Pane, Analytics Pane, etc.) Tableau field types Saving and publishing a data source Live vs extract connection Various file types Ways to share and export the work done in Tableau **Hands-on Exercise:** 1. Play with Tableau desktop 2. Learn about the interface 3. Share and export existing works
5	4 Hours	Data Visualization	Charts:- Histograms Box plot Motion Pie Bar Line Bubble Bullet Scatter Tree Heat maps Maps Text table Highlighted table

6	4 Hours	Working with Metadata and Data Blending	Connecting to Data Source Tableau data types Connection to Excel Cubes and PDFs Management of metadata and extracts Data preparation Joins (Left, Right, Inner, and Outer) and Union Dealing with NULL values, cross-database joining, data extraction, data blending, refresh extraction, incremental extraction, how to build extract, etc. cross-database joining Data blending **Hands-on Exercise:** 1. Connect to Excel sheet to import data 2. Use metadata and extracts 3. Manage NULL values 4. Clean up data before using 5. Perform the join techniques 6. Execute data blending from multiple sources
7	4 Hours	Advanced Data Manipulations	Preview Mark and highlight Groups Sets (creating and editing sets, IN/OUT) Constant sets Computed sets Combined sets Bins Hierarchies Sorting and Types Using the Formatting pane to work with the menu, fonts, alignments, settings, etc. Editing axes and annotations **Hands-on Exercise:** 1. Use marks to create and edit sets 2. Highlight the desired items 3. Make Groups 4. Apply sorting on results 5. Make hierarchies among the created sets
8	6 Hours	Working with Filters,Organizing Data & Visual Analytics	Working with Filters Filters (addition and removal) Filtering continuous dates, dimensions, and measures Filtering in Tableau Types of filters Filtering the order of operations **Hands-on Exercise:** 1. Use the data set by date/dimensions/measures to add a filter 2. Use interactive filter to view the data 3. Customize/remove filters to view the result Organizing Data and Visual Analytics Preview K-means cluster analysis Trend and reference lines Visual analytics in Tableau Forecasting, confidence interval, reference lines, and bands **Hands-on Exercise:** 1. Apply labels and tooltips to graphs, annotations, edit axes' attributes 2. Set the reference line 3. Perform k-means cluster analysis on the given dataset

9	3 Hours	Working WIth Mapping ,Calculations and Expressions	Working on coordinate points Plotting longitude and latitude Editing unrecognized locations Customizing geocoding, polygon maps, WMS: web mapping services Working on the background image, including add image Plotting points on images and generating coordinates from them Map visualization, custom territories How to create map projects in Tableau **Hands-on Exercise:** 1. Plot longitude and latitude on a geo map 2. Edit locations on the geo map 3. Custom geocoding 4. Use images of the map and plot points 5. Find coordinates Calculation syntax and functions in Tableau Various types of calculations, including Table, String, Date, Aggregate, Logic, and Number Quick table calculations The creation of calculated fields
10	2 Hours	Working with Parameters	Creating parameters Parameters in calculations Using parameters with filters Column selection parameters Chart selection parameters How to use parameters in the filter session How to use parameters in the reference line **Hands-on Exercise:** 1. Creating new parameters to apply on a filter 2. Passing parameters to filters to select columns 3. Passing parameters to filters to select charts
11	5 Hours	Dashboards and Stories	What is a dashboard? Building and formatting a dashboard using size, objects, views, filters, and legends Best practices for making creative as well as interactive dashboards using the actions Creating stories Including the intro of story points Creating as well as updating the story points Adding catchy visuals in stories Adding annotations with descriptions; dashboards and stories Highlight actions, URL actions, and filter actions Selecting and clearing values Dashboard examples using Tableau workspace and Tableau interface **Hands-on Exercise:** 1. Create a Tableau dashboard view, include legends, objects, and filters 2. Make the dashboard interactive 3. Use visual effects, annotations, and descriptions to create and edit a story
12	3 Hours	Build Tableau Web Application	Introduction to Flask Working with Flask Framework Building application with flask framework Embedding Dashboard & Story with web application