COURSE NAME:	Data Analytics & Visualization
TOTAL DURATION:	45 Hrs
MODE OF DELIVERY	PHYSICAL CLASSROOM TRAINING AT RESPECTIVE COLLEGES
TRAINER TO STUDENT RATIO:	1:50
TOTAL MARKS:	75

Table 1	
OVERALL COURSE OBJECTIVE:	1. Evaluate data visualization tools like Microsoft Excel, Power BI, and MySQL to recommend optimal solutions for effective data analysis. 2. Critique the use of advanced Excel formulas, pivot tables, and dashboards in presenting actionable insights for business scenarios. 3. Construct dynamic Power BI dashboards incorporating KPIs and interactive elements to support real-time decision-making. 4. Design end-to-end workflows for data cleaning, standardization, and transformation using SQL and Power Query. 5. Develop comprehensive data models and advanced visualizations that cater to organizational reporting standards.

| **LEARNING OUTCOME:** | 1. Evaluate data visualization techniques using Excel, Power BI, and MySQL to recommend effective solutions for business decision-making.
 2. Critique data cleaning and transformation processes to ensure data accuracy, consistency, and readiness for analysis.
 3. Construct interactive dashboards in Power BI, incorporating KPIs and dynamic visual elements to support real-time strategic decisions.
 4. Design comprehensive workflows for integrating and standardizing data from multiple sources using SQL and Power Query.
 5. Develop visualizations and reports that effectively communicate complex data insights and trends to diverse stakeholders. |

SL.NO	MODULE NAME	MODULE CONTENT	MODULE LEARNING OUTCOME	DURATION (HRS)
			TABLE 2: MODULE WISE COURSE CONTENT AND OUTCOME	
1	Introduction to Data Analysis	Overview of data visualization tools and their applications.	Evaluate the significance of data visualization tools in extracting actionable business insights.	5
2	Excel for Data Visualization	Pivot tables, advanced formulas, and chart customization.	Critique Excel functionalities to present insights and trends effectively.	8
3	MySQL for Data Management	Basic SQL queries, joins, and data cleaning techniques.	Develop SQL queries for data retrieval, standardization, and multi-table analysis.	10
4	Power BI Fundamentals	Dashboard creation, data modelling, and advanced visualizations.	Construct interactive Power BI dashboards to showcase KPIs and actionable insights.	12
5	Executive Reporting	KPI design, storytelling with charts, and professional reporting techniques.	Design executive dashboards with clear, concise visualizations	10

			and decision-making capabilities.	

TABLE 3: OVERALL COURSE LEARNING OUTCOME ASSESSMENT CRITERIA AND USE CASES			
LEARNING OUTCOME	**ASSESSMENT CRITERIA**	**Performance Criteria**	**USE CASES**
Evaluate advanced Excel functionalities for data analysis.	Use pivot tables, conditional formatting, and calculated fields to derive insights from datasets.	Demonstrates proficiency in creating pivot tables and customizing charts to showcase business trends effectively.	Use Case: Build a sales performance dashboard for a retail company, highlighting regional and product trends.
Critique SQL techniques for data retrieval and cleaning.	Write optimized SQL queries for filtering, sorting, and aggregating data while ensuring standardization.	Efficiently retrieves and organizes data from single and multi-table databases for meaningful analysis.	Use Case: Create a customer segmentation report for a CRM database using advanced SQL joins and filters.
Construct Power BI dashboards for executive reporting.	Create interactive dashboards using slicers, drill-throughs, and DAX calculations.	Produces visually appealing dashboards with dynamic elements, providing real-time decision-making capabilities.	Use Case: Design a Power BI dashboard tracking monthly revenue and customer satisfaction for a hospitality chain.
Design workflows for data transformation and integration.	Use Power Query and SQL functions to clean and merge datasets from multiple sources.	Ensures data is accurate, standardized, and ready for analysis through robust cleaning and transformation	Use Case: Integrate marketing data from Google Analytics and CRM tools for campaign

Develop advanced charts and KPIs for storytelling.	Create combination charts, trendlines, and hierarchical visualizations to represent complex data trends.	Demonstrates the ability to communicate insights effectively using advanced charts and customized visualizations.	Use Case: Build a profitability analysis report using waterfall and decomposition tree charts in Power BI.
		processes.	performance evaluation.

TABLE 4: LIST OF FINAL PROJECTS (PROJECTS THAT COMPREHENSIVELY COVER ALL THE LEARNING OUTCOME)	
SL.NO	**FINAL PROJECT**
1	**Goods Receipt Note** Confirm and document the receipt of goods into the warehouse, ensuring accurate inventory records and timely updates for efficient tracking and stock management.
2	**Delivery Receipt** Document and track the delivery of goods from the warehouse, providing detailed insights into conditions, quantities delivered, and ensuring accountability in the supply chain.
3	**Sales Performance Dashboard** Create an interactive dashboard to monitor and evaluate sales trends across regions and product categories, enabling decision-makers to identify high-performing areas and optimize strategies.
4	**Customer Segmentation Analysis** Develop a data model to segment customers based on purchase behavior and demographic attributes, providing actionable insights for targeted marketing campaigns.

5	**Inventory Forecasting System** Design a forecasting tool to predict inventory needs based on historical sales data and seasonal trends, ensuring optimal stock levels and minimizing overstock or stockouts.

TABLE 5: COURSE ASSESSMENT RUBRICS (TOTAL MARKS: 75)					
ASSESSMENT CRITERIA	**Learning Outcome**	**Fair (1–5)**	**Good (6–10)**	**Excellent (11–15)**	**TOTAL MARKS**
Data Analysis with Excel	Evaluate advanced Excel functionalities for data analysis.	Basic understanding of Excel tools with limited application.	Applies Excel techniques effectively to create functional data analysis outputs.	Demonstrates mastery in advanced Excel tools with insightful, actionable data visualizations.	15
SQL for Data Management	Critique SQL techniques for data retrieval and cleaning.	Writes basic SQL queries with limited optimization or scalability.	Produces optimized SQL queries with effective data cleaning and multi-table joins.	Designs efficient, scalable SQL workflows for advanced data management and integration tasks.	15
Interactive Dashboard Creation	Construct Power BI dashboards for executive reporting.	Basic dashboard with limited interactivity and insights.	Creates functional dashboards with moderate interactivity	Produces advanced, interactive dashboards tailored for strategic	15

			and relevant visualizations.	decision-making.	
Data Cleaning and Transformation	Design workflows for data transformation and integration.	Applies basic cleaning techniques with minimal transformations.	Uses Power Query and SQL to clean and integrate datasets effectively, with moderate transformations.	Designs comprehensive workflows integrating data sources seamlessly, ensuring high accuracy and usability.	15
Reporting and Visualization	Develop advanced charts and KPIs for storytelling.	Creates basic visualizations lacking clarity or depth.	Produces well-structured visualizations with clear insights.	Designs innovative visualizations, effectively communicating complex data stories and trends.	15