



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Business Administration

Level: PG

Course / Subject Code: MB03092111

Course / Subject Name: Data Modelling and Visualization

w. e. f. Academic Year:	2025-2026
Semester:	3
Category of the Course:	Specialization Advanced Business Research (Major 3)

Prerequisite:	Any Graduate
Rationale:	This Subject equips students with essential analytical tools to understand, interpret, and communicate data-driven insights for informed decision-making. By integrating techniques like simulation, decision models, and interactive dashboards, the subject fosters practical problem-solving in business contexts. It also enhances students' ability to present complex information clearly, enabling effective communication with stakeholders.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Understand and explain the concepts of data modelling and visualization	Understand
02	Apply data modelling techniques for solving business problems using Excel and open-source tools	Apply
03	Analyze business scenarios using decision models and simulations	Analyze
04	Evaluate different visualization techniques and choose the appropriate type for effective communication	Evaluate
05	Create interactive dashboards and visualizations using Power BI, Tableau, and open-source tools	Create

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial / Practical	
			ESE (E)		PA / CA (M)	PA/CA (I)	ESE (V)	
3	1	0	4	70	30	50	0	150



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Introduction to Data Modelling <ul style="list-style-type: none">• Role of Data Modelling in Business Analytics• Structured vs. Unstructured Data• Introduction to Excel as a Modelling Tool• Introduction to Open-Source Spreadsheet Tools (LibreOffice Calc, Google Sheets)• Principles of Good Modelling Practice• Types of Models: Descriptive, Predictive, Prescriptive	10	17
2.	Business Modelling with Excel and Open-Source Tools <ul style="list-style-type: none">• What-if Analysis (Goal Seek, Scenario Manager, Data Tables)• Financial Models (NPV, IRR, Payback, Break-even Analysis)• Forecasting and Regression Models• Linear Programming and Solver Tool• Sensitivity and Scenario Analysis• Introduction to Python with Pandas for Modelling (Basic)• Models: Sales Forecasting, Product Mix Optimization, Profit Planning, Portfolio Optimization, RFM segmentation, CLV Segmentation, Customer Churn prediction, Campaign ROI, Employee Attrition Prediction.	12	18
3.	Data Visualization Principles and Tools <ul style="list-style-type: none">• Importance of Data Visualization in Business Decisions• Principles of Effective Visualization (Tufte's Guidelines, Gestalt Principles) Types of Charts: <ul style="list-style-type: none">• Categorical: Bar, Column, Pie• Temporal: Line, Area• Hierarchical: Tree-map, Sunburst• Relational: Scatter, Bubble• Spatial: Map Visualizations Advanced Visualizations: <ul style="list-style-type: none">• Waterfall, Box Plot, Radar Chart, Funnel, Heatmap• Choosing the Right Chart• Building Visual Narratives Dashboards: <ul style="list-style-type: none">• KPIs and Metrics	13	17



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	<ul style="list-style-type: none"> • Layout & Design Principles • Filters, Slicers, Drill-downs <p>Tools to be Discussed:</p> <ul style="list-style-type: none"> • Microsoft Power BI • Tableau Public • Apache Superset • Meta-base 		
4.	<p>Data Visualization in Power BI, Tableau and Open-Source Tools</p> <ul style="list-style-type: none"> • Connecting Data Sources (Excel, SQL, Web Data) • Data Cleaning and Preparation in Power BI/Tableau • Creating Visual Reports • Measures, Calculated Columns, and DAX (Power BI) • Publishing Dashboards • Collaboration and Sharing • Case Studies: Sales Dashboard, Financial Performance, Customer Segmentation 	10	18
5.	<p>Hands-On Exercises:</p> <ul style="list-style-type: none"> • Business model design using Excel & Python • Dashboard development using Power BI/Tableau • Data analysis using Google Sheets and LibreOffice • Model simulation and scenario analysis 	15	CEC(30 Marks)
Total		60	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
20%	30%	25%	0%	15%	10%

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

No.	Author	Title	Publisher	Edition
1	Winston, Wayne L & S. Albright	Data Analysis and Decision Making	South-Western College Publishing	Latest
2	Alberto Cairo	The Truthful Art: Data, Charts, and Maps for Communication	New Riders Publication	Latest
3	Cole Nussbaumer Knaflic	Storytelling with Data	Wiley	Latest



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(b) Open-source software and website:

1. Power BI Tutorials: <https://learn.microsoft.com/en-us/power-bi/>
2. Tableau Resources: <https://www.tableau.com/learn/training>
3. Superset Docs: <https://superset.apache.org/docs/intro>
4. Metabase Docs: <https://www.metabase.com/docs/>
5. <https://datarootlabs.com/blog/complex-data-visualization-with-tableau-use-cases>
6. <https://www.datalabsagency.com/case-studies/?v=b870c45f9584>

CO- PO Mapping:

Semester 3 Course Outcomes	Course Name: Data Modelling & Visualization				
	POs				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	–	1	1
CO2	3	3	1	1	2
CO3	2	3	2	2	2
CO4	2	2	1	3	2
CO5	3	3	1	2	2

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO.

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