Faculty of Computer Application
B.Sc. (IT) (FinTech-IT in Finance)

- **Semester– 6**
- **Subject Code: 05FN0601**
- **Subject Name: FinTech Data Visualization**
- **Objectives:**

1. To understand the fundamental principles of data visualization in the context of financial data.
2. To explore key tools and technologies for creating effective visualizations using Python and BI tools.
3. To provide practical experience in building dashboards and data-driven storytelling in FinTech.
4. To analyze financial trends and patterns using visualization techniques.
5. To implement visual solutions that enhance decision-making in financial services.

- **Prerequisites:** Basic Python Programming, Statistics, and Financial Concepts

Unit No	Topic Covered	No of Hours Required
1	**Introduction to Financial Data & Visualization** • Importance of data visualization in FinTech • Types of financial data (stock, forex, crypto, transactions) • Visualization tools overview (Matplotlib, Seaborn, Plotly, Tableau, Power BI) • Principles of effective visual design	11
2	**Data Preparation and Wrangling** • Importing data (CSV, APIs, Web scraping) • Handling missing/erroneous data • Date-time formatting in financial datasets • Data grouping, filtering and normalization	11
3	**Python-based Financial Visualization** • Line plots, candlestick charts, bar charts for financial data • Moving averages, Bollinger bands, correlation plots • Plotting real-time price data using APIs • Introduction to Plotly for interactive graphs	11

4	**Dashboards and Storytelling** • Building interactive dashboards using Tableau/Power BI • Designing KPIs, slicers, filters, and custom visuals • Financial report generation and storytelling through data • Use-cases: Loan risk analysis, stock monitoring, fraud detection	**12**

Course Outcomes:

1. Students will understand the role of data visualization in financial technology.
2. Students will be able to clean, prepare, and visualize financial datasets.
3. Students will use Python libraries and BI tools for effective visualization.
4. Students will create dashboards that support financial decision-making.
5. Students will implement storytelling techniques using real-world financial data.

Course Outcomes – Program Outcomes Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	H	H		M					H		L
CO2	M	H		L					M	M	M
CO3	M			L	L	H			H	M	M
CO4	H	H	L			M			L	L	L
CO5	M	L		H		M	M				L

Text Book:

Storytelling with Data by Cole Nussbaumer Knaflic, 2019

Reference Books:

- Python for Data Analysis by Wes McKinney, 2019
- Interactive Data Visualization for the Web by Scott Murray, 2020
- Data Science for Finance by Sergio M. Focardi, 2020

App & Web References:

- Kaggle Datasets (Financial)
- Tableau Public Gallery

- Yahoo Finance API
- Alpha Vantage API
- Matplotlib / Seaborn / Plotly Official Docs

Syllabus Coverage from text /reference book & web/app reference:

Unit No	Chapter Numbers / Sources
1	Storytelling with Data - Ch 1, 2; Plotly Docs
2	Python for Data Analysis - Ch 5, 6
3	Plotly, Matplotlib Docs; Alpha Vantage API
4	Tableau/Power BI Official Tutorials

PRACTICALS

	Numbers of Hours Required: 60	
➢ **1**	➢ Load and clean financial datasets (CSV, JSON) ➢ Create static and interactive visualizations (line chart, candlestick) ➢ Apply moving averages, volume overlays, and Bollinger bands ➢ Analyze Bitcoin or stock market trends over time	
➢ **2**	➢ Use Plotly Express and Graph Objects for OHLC visualization ➢ Develop a mini dashboard using Dash (Python framework) ➢ Create subplots for multi-variable comparisons	
➢ **3**	➢ Build an interactive loan eligibility dashboard ➢ Visualize mutual fund comparisons using slicers and bar graphs ➢ Design KPI-driven executive reports	
➢ **4**	➢ Cryptocurrency trend dashboard with real-time data ➢ Fraud detection visual analytics using bank transactions ➢ Storytelling project: Impact of inflation on investments	