SYLLABUS FOR DATA ANALYTICS

PYTHON:

Python Basics

- Introduction to Python
- Applications
- Variables
- Keywords
- Comments
- Input/ Output
- Data Types
- Typecasting
- Operators and expressions

Control Flow

- Conditional Statements (If- elif- else)
- Loops (For, while)
- Loop controls (break, pass, control)
- Exception handling

Data Structures

- Lists
- Tuples
- Dictionaries
- Sets

Functions and Modules

- Defining and calling functions
- Arguments and return values
- Built-in functions
- Importing libraries

OOPS

- Classes and objects
- Dunder Methods
- Inheritance
- Abstraction
- Encapsulation
- Polymorphism

File Handling

- Reading and writing files (.txt, .csv)

- Working with file paths

Libraries for Data Analytics

- **NumPy**: Arrays, mathematical operations, broadcasting

- **Pandas**: Series, DataFrames, reading data, data cleaning, filtering, grouping, merging, etc

- **Matplotlib & Seaborn**: Data visualization (bar chart, line chart, scatter plot, histograms, etc)

MICROSOFT EXCEL:

Basics & Aggregation

- Datatypes

- Absolute & Relative Reference

- Aggregation Functions: SUM, MAX, MIN, COUNT, AVERAGE, etc.

- Count Functions: COUNTA, COUNTBLANK

- Date and Time Functions: DATEDIF, NETWORKDAYS, WORKDAYS

Logical & Conditional Functions

- Logical Functions: IF, IF ELSE, IFS, AND, OR, NOT

- Conditional Formatting:

    o Basic

    o Custom

    o Advanced

- Named Range and Table Range

Lookup & Analysis

- Lookup Functions: VLOOKUP, HLOOKUP, INDEX, MATCH, OFFSET, INDIRECT

Pivot & Dashboards

- Pivot Table

- Dashboards

- Introduction to Data Modelling

MySQL:

Introduction to SQL & Databases

- Overview of Databases

- Introduction to MySQL & MySQL Workbench

- ACID Properties

- Data Types in SQL

- DDL, DML commands

- Constraints

- Basic Queries:

    o SELECT, WHERE, GROUP BY, HAVING, ORDER BY, LIMIT

Joins & Subqueries

- Subqueries

- Joins:

    o INNER JOIN

    o LEFT JOIN

    o RIGHT JOIN

    o FULL OUTER JOIN

    o SELF JOIN

    o CROSS JOIN

- Data Transformation Techniques

- Date and Time Manipulation

- Case When Statements

- Common Table Expressions (CTE)

- Recursive CTE

Advanced SQL Functions

- **Window Functions:**

    o ROW_NUMBER()

    o RANK()

    o DENSE_RANK()

    o PERCENT_RANK()

    o NTILE()

- LEAD(), LAG()
  - FIRST_VALUE(), LAST_VALUE(), NTH_VALUE()
- Stored Procedures
- **Transaction Control Language (TCL):**
  - COMMIT, ROLLBACK, SAVEPOINT
- Views

Power BI:

Introduction & Basic Charts

- Introduction to Power BI & Power BI Service
- Visualizations:
  - Bar Chart, Pie Chart, Donut Chart, Funnel Chart
  - Ribbon Chart, Line Chart, Area Chart
  - Combo Chart, Scatter Plot, Waterfall Chart
  - Treemap, Maps, Filled Maps

Tables & Formatting

- Tables and Matrix Visuals
- Conditional Formatting
- Slicers, Multi-row Cards, Filter Pane
- Animated Bar Chart, Word Cloud
- Sunburst, Gauge, Infographics
- Inserting Objects in Power BI: Text, Image, Shapes

Reports & Publishing

- Creating Reports in Power BI

- Publishing to Power BI Service

- Power BI Dashboard

- Refreshing Data

- Power BI Power Query Introduction

- Adding/Removing Rows, Text Functions, Add/Remove Columns

- Transform Columns

Data Transformation

- Number Functions

- Date and Time Transformation

- Appending & Merging Queries

- Conditional Columns

- FILL, GROUP BY, TRANSPOSE

- Keep & Remove Columns/Rows

- Importing Datasets into Power BI

- Connecting Power BI to SQL

Advanced Modeling & DAX

- Creating & Deleting Relationships

- Data Normalization (1NF, 2NF, 3NF)

- OLTP vs OLAP

- Star Schema & Snowflake Schema

- DAX:

  - Basic to Advanced Functions

  - Date Functions, Text Functions, Logical Functions

- Introduction to M Language

- Custom Tools & Queries in M

Python & R in Power BI

- Using Python Scripts in Power BI

- Using R Scripts in Power BI

- Importing Data from:

    - SQL

    - Other Data Sources (Excel, Web, etc.)

- Data Modeling

- Row-Level Security (RLS):

    - Static & Dynamic

    - Enhanced RLS

    - RLS with Manager Access