

Python Syllabus for Data Analytics (Brief)

1. Python Basics

- Introduction to Python and IDEs (Jupyter, VS Code)
- Variables, Data Types (int, float, string, boolean)
- Input/Output
- Operators and Expressions

2. Control Flow

- Conditional Statements (if, elif, else)
- Loops (for, while)
- Loop control: break, continue, pass

3. Functions and Modules

- Defining and calling functions
- Arguments and return values
- Built-in functions
- Importing libraries (math, random, etc.)

4. Data Structures

- Lists and List Comprehensions
- Tuples
- Dictionaries
- Sets

5. File Handling

- Reading and writing files (.txt, .csv)
- Working with file paths

6. Libraries for Data Analytics

- **NumPy**: Arrays, mathematical operations, broadcasting
- **Pandas**: Series, DataFrames, reading data, data cleaning, filtering, grouping, merging
- **Matplotlib & Seaborn**: Data visualization (bar chart, line chart, scatter plot, histograms)

7. Data Cleaning and Preparation

- Handling missing data
- Renaming and dropping columns
- Filtering and sorting data
- Encoding categorical data

8. Exploratory Data Analysis (EDA)

- Descriptive statistics
- Correlation and cross-tabulation
- Visualization techniques

9. Basic Statistics with Python

- Mean, Median, Mode, Variance, Std. Deviation
- Probability and distributions (Normal, Binomial)

10. Introduction to Machine Learning (Optional Preview)

- Basics of supervised learning
- Using **scikit-learn** for simple models (e.g., Linear Regression)

OOPs (Object-Oriented Programming) in Python

1. Introduction to OOP

- What is Object-Oriented Programming?
- Importance of OOP in Python

2. Classes and Objects

- Creating classes using `class`
- Instantiating objects
- `__init__()` constructor method

3. Attributes and Methods

- Instance variables and methods
- Class variables
- `self` keyword

4. Encapsulation

- Public vs Private attributes
- Getters and Setters

5. Inheritance

- Single and multiple inheritance
- `super()` function

6. Polymorphism

- Method Overriding

- Operator Overloading

7. Abstraction

- Abstract classes and methods using `abc` module

8. Special Methods (Dunder Methods)

- `__str__()`, `__repr__()`, `__len__()`, etc.
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♦ Where to place OOP in a syllabus?

For **Data Analytics learners**, you can place it toward the **end of the course** or in a **"Bonus/Advanced Concepts"** section.

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MS Excel Syllabus for Data Analytics

Week 16: 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`
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Week 17: Logical & Conditional Functions

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

- Conditional Formatting:
 - Basic
 - Custom
 - Advanced
 - Named Range and Table Range
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Week 18: Pivot & Dashboards

- Pivot Table
 - Dashboards
 - Power Query & Power Pivot
 - Introduction to Data Modelling
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Week 19: Lookup & Analysis

- Lookup Functions: **VLOOKUP**, **HLOOKUP**, **INDEX**, **MATCH**, **OFFSET**, **INDIRECT**
 - What-If Analysis
 - Solver
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MySQL Syllabus for Data Analytics

Week 26: Introduction to SQL & Databases

- Overview of Databases
- Introduction to MySQL & MySQL Workbench

- ACID Properties
 - Data Types in SQL
 - DDL, DML commands
 - Constraints
 - Basic Queries:
 - `SELECT, WHERE, GROUP BY, HAVING, ORDER BY, LIMIT`
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Week 27: Joins & Subqueries

- Subqueries
- Joins:
 - `INNER JOIN`
 - `LEFT JOIN`
 - `RIGHT JOIN`
 - `FULL OUTER JOIN`
 - `SELF JOIN`
 - `CROSS JOIN`
- Data Transformation Techniques
- Date and Time Manipulation
- Case When Statements
- Common Table Expressions (CTE)
- Recursive CTE

Week 28: Advanced SQL Functions

- **Window Functions:**
 - `ROW_NUMBER()`
 - `RANK()`
 - `DENSE_RANK()`
 - `PERCENT_RANK()`
 - `NTILE()`
 - `LEAD()`, `LAG()`
 - `FIRST_VALUE()`, `LAST_VALUE()`, `NTH_VALUE()`
- **Stored Procedures**
- **Transaction Control Language (TCL):**
 - `COMMIT`, `ROLLBACK`, `SAVEPOINT`
- **Views**



Power BI Syllabus for Data Analytics

Week 20: 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
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Week 21: 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
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Week 22: 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
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Week 23: 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
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Week 24: 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
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Week 25: 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
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Topics to Cover in the Demo (1.5–2 hours max)

1. Introduction (10 mins)

- What is Data?
 - Difference between Data Analytics & Data Science
 - Real-world examples (Flipkart, Netflix, Zomato, Bank fraud detection)
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2. Career Scope (5 mins)

- Job roles: Data Analyst, Data Scientist, BI Analyst, ML Engineer
- Tools used: Python, Excel, SQL, Power BI, ML, AI

- Salary Range (India/Global)
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3. Roadmap for Learning (10 mins)

- Start with: Excel → SQL → Python → Power BI → ML
 - Optional: Statistics, AI, Big Data
 - Certifications (Google, IBM, etc.)
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4. Mini Hands-On Demo (45 mins)

Show a real example using simple tools:

Option A: Excel

- Dataset: Sales or Student Data
- Use Pivot Table & Chart
- Insights like: Top-selling product, Monthly sales

Option B: Python + Pandas (Jupyter Notebook)

- Load a CSV file (students.csv or sales.csv)

Use:

```
python
CopyEdit
import pandas as pd
df = pd.read_csv("students.csv")
df.head()
df.describe()
df['Marks'].mean()
```

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- Create a simple chart using `matplotlib` or `seaborn`

Option C: Power BI

- Load same dataset
 - Create:
 - Bar chart (Product vs Sales)
 - Card (Total Sales)
 - Slicer for Month
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5. Q&A / Interaction (10–15 mins)

- Ask them what industries they are interested in
 - Give ideas for projects: e.g., E-commerce analysis, Movie success prediction
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Materials to Prepare

- Sample datasets (Excel or CSV)
- Jupyter Notebook or Power BI pre-installed
- PPT with:
 - What is DA/DS
 - Tools & Skills
 - Learning Path
 - Career Roles

Need Help With Files?

I can give you:

-  Ready PPT for Demo
-  Excel and CSV sample datasets
-  Python Notebook
-  Sample Power BI file