

Course: Data Science

Computer Collegiate

4 Months

2 Classes per week

Class Duration: 2 Hours (1 Hour Theory + 1 Hour Practical)

Tools Covered: Python, Jupyter Notebook, Pandas, NumPy, Matplotlib, Seaborn, SQL, Excel, Power BI

Week 1 – Introduction to Data Science

Topics: What is Data Science, lifecycle, roles, tools intro, install Python/Anaconda/Jupyter

Practical/Assignment: Install environment and run first Python program

Week 2 – Computer Basics + Python Fundamentals

Topics: Files/folders, CSV/XLSX basics, variables, data types, operators, input/output

Practical/Assignment: Marks sheet, calculator

Week 3 – Python Control Structures

Topics: If/else, loops, break, continue

Practical/Assignment: ATM menu, result system

Week 4 – Python Data Structures

Topics: Lists, tuples, sets, dictionaries, basic functions

Practical/Assignment: Student record system

Week 5 – Python Functions + Error Handling

Topics: Functions, parameters, return, try/except

Practical/Assignment: Reusable calculator, validation forms

Week 6 – NumPy Basics

Topics: Arrays, indexing, slicing, math ops

Practical/Assignment: Sales/statistical calculations

Week 7 – Pandas Basics

Topics: Series, DataFrames, import CSV, head/tail/info

Practical/Assignment: Clean dataset

Week 8 – Data Cleaning Advanced

Topics: Missing values, duplicates, text cleanup, dates

Practical/Assignment: Messy dataset cleanup

Week 9 – Data Manipulation

Topics: Filtering, groupby, sort, merge, aggregate

Practical/Assignment: Monthly sales analysis

Week 10 – Excel for Data Analysts

Topics: Formulas, pivot tables, charts, lookup basics

Practical/Assignment: Interactive Excel report

Week 11 – Data Visualization

Topics: Matplotlib, Seaborn, line/bar/pie/histogram/heatmap

Practical/Assignment: Business charts

Week 12 – Power BI Basics

Topics: Load data, visuals, slicers, dashboard layout

Practical/Assignment: Mini dashboard

Week 13 – SQL for Data Science

Topics: Tables, keys, SELECT, WHERE, GROUP BY, JOIN

Practical/Assignment: Customer/revenue analysis

Week 14 – Statistics for Data Science

Topics: Mean, median, mode, variance, std dev, correlation

Practical/Assignment: Statistical report

Week 15 – Machine Learning Basics

Topics: Supervised/unsupervised, train/test, regression, clustering

Practical/Assignment: First sklearn model

Week 16 – Capstone Project

Topics: Problem definition, cleaning, analysis, dashboard, ML, presentation

Practical/Assignment: Final submission