

Course Name	Python for Machine Learning
Course Duration	5 Day (40 hours)
Target Audience	Data Analyst, Business Analysts, Data Scientist
Course Outcomes	Master Python fundamentals for data manipulation and analysis.
	Explore data types, control flows, and operators in Python.
	Gain proficiency in data pre-processing and cleaning techniques.
	Perform exploratory data analysis using Pandas and NumPy.
	Develop skills in data visualization with Matplotlib.

Module	Content
Introduction to Python and Basics	Definition & Applications
	Features, Versions & Working
	Anaconda & Different IDEs for Python
	Introduction to IDE's - Jupiter Notebook, Spyder & Google Colab
Data Types and Control Flows	Literals, reserved words and input functions
	Data Types: int, float, bool, str
	Decision Control Flows: If / Nested If / If-else / If-elif-else
	Control Flow Loops: While loop, For loop, While-else, For-else
	Operators: Arithmetic, Relational or Comparison, Logical
Lists, Tuples, Sets, and Dictionaries	Bitwise Operators, Assignment Operators, Ternary Operator
	List: Ways of Accessing Values, Traversing Elements, List Operations, List Methods, Membership Operator, List Comprehension
	Tuples: Creating Tuples, Ways of Accessing Values, Tuple Vs Immutability, Tuple Comprehension
	Sets: Creating Sets, Ways of Accessing Values, Manipulating and Accessing Sets, Set Operations
	Dictionary: Why Dictionary, creating a Dictionary, Accessing Values, Updating Dictionaries, Functions of Dictionary
File Handling and Strings	File Handling: Types of Files, Opening and Closing Files, Writing, Appending, and Reading Files
	Strings: String Literals, Single (") & Double Quotes (""), Triple Quotes (""), Raw Strings ("r...' ") and Operations on strings
	Dictionary: Accessing Values, Updating Dictionaries, Functions of Dictionary
Iterators & Generators	Iterator vs Iterable, Containers, Generators in Python
Regular Expressions	Uses of Regular Expressions - Text Analytics, import re, Character Classes, Backslash, Alteration, Quantifiers
OOPS Concept	Class, Classes and Object, Creating Object, Accessing Objects, Need and Use of Self, Class Method, __init__() constructor
Introduction to NumPy, Pandas & Matplotlib	Introduction to NumPy, Install NumPy
	Array Creation, Array Reshaping, Indexing, Operations
	Introduction to Pandas, Slicing Data, Slicing DataFrame
	Data Visualization with Matplotlib
Introduction to Data Preprocessing	Filtering DataFrame, Transforming DataFrame, Advanced Indexing

	Data Cleaning & Data Preprocessing
Exploratory Data Analysis (EDA)	Data Cleaning Techniques, Handling Missing Data, Handling Categorical Data
	Introduction to EDA, 2D Scatter-plot, 3D Scatter-plot, Pair plots
	Univariate, Bivariate, and Multivariate Analysis, Box-plot
	Variance and Standard Deviation, Median, IQR (Interquartile Range)
Advanced Pandas and Data Visualization	Advanced Pandas, Advanced Indexing, Data Preparation
	Handling Missing Data, handling Categorical Data, Data Cleaning
Data Visualization	Introduction to Data Visualization, Plotting with Matplotlib
	Scatter Plots, Line Plots, Bar Plots, Pie Charts, Heatmaps
Project Work	Problem Statement, Data Collection, Data pre-processing (Exploratory Data Analysis), Feature Engineering (optional), Data visualizations (Pandas, NumPy & Matplotlib), Project Final Outcome & findings