

Table of Content

Training Topic: Data Science with Python

Objective of the training:

1. This Python training program covers essential fundamentals and practical skills for participants.
2. It includes setting up the Python environment, mastering core data structures, working with functions and modules, and handling exceptions and files.
3. Participants will also gain proficiency in key libraries for data science, such as NumPy, Matplotlib, Pandas, and Beautiful Soup, enabling them to analyse data and visualize it effectively.
4. Additionally, this training introduces Object-Oriented Programming (OOP) concepts, enhancing participants' coding abilities for more complex projects and data ingestion through web scraping."

Tools / Software : Anaconda Navigator

Table of Content

SI No	Module Name	Sub-Module	Expected Learning outcome	Duration in Hrs
1	Python setup	Introduction to Python Setting up the Python environment Installing Anaconda Navigator and Jupyter Notebook Working with Jupyter notebooks Simple Input/Output, Working with Numbers and constants	Participants will learn basics of python and install Jupyter notebook	4
2	Python fundamentals	Basic Data Types, Variables, Input and built in statements Operators - Arithmetic, assignment, comparison, Bitwise & Logical operators	Participants will learn datatypes and operator concepts	4
3	Conditional statements and loops	Control Structures - if and else conditions, else if and nested if conditions Looping constructs - while Loop, for Loop, break and continue, nested loops	Participants will be well versed with conditional statements and loops	4
4	Data structures	Python Core Data Structures Strings and string operations, string manipulation, Lists, List operations Tuples,	Participants will be well versed with Data structures in Python and its operations	4
5	Advanced Data structures	Dictionaries, Sets, List Comprehensions	Participants will be well versed with advanced Data structures in Python and its operations	4
6	Functions	Introduction to Functions, Function Syntax, user defined and built-in functions, Introduction to Modules, Create Modules, Importing Modules Lambda Functions - Map, Filter, Reduce	Participants will learn functions and modules	4
7	RegEx	Lambda functions and Regular expressions	Participants will learn Regular expressions and how to use them	4
8	File Handling and Exception Handling	Exception handling - Try and except blocks File Handling and file operations: Reading, Writing and appending text files, working with different types of files and file formats	Participants will learn to work with files and learn to use exception handling	4

SI No	Module Name	Sub-Module	Expected Learning outcome	Duration in Hrs
9	Numpy	Python Libraries for Data Science Numpy - Introduction to arrays, Array operations, Broadcasting NumPy array creation, NumPy datatypes, NumPy indexing, slicing, Basic Reduction, Statistical & Logical operations, Array shape manipulation, Array sorting, copies and views	Participants will learn how to use numpy and its functions	4
10	Matplotlib	Data visualization using Matplotlib Getting Started with Matplotlib Basic Plots (Scatter, Bar, Pie, Line graphs) Matplotlib Customizations Multiple Plots and Subplots Saving and Exporting Plots Data Exploration with Matplotlib Working with text and annotations in Matplotlib working with advanced visuals in Matplotlib	Participants will learn various visualizations and graphs using Matplotlib for data science	4
11	Seaborn	Data visualization using seaborn Getting Started with seaborn Exploring different visuals in seaborn (Regplot, jointplot, pairplot, catplot, heatmaps) Data Exploration with seaborn, working with advanced visuals in Seaborn	Participants will learn various visualizations and graphs using Seaborn for data science	4

SI No	Module Name	Sub-Module	Expected Learning outcome	Duration in Hrs
12	Pandas basics	Working with Pandas Series and Dataframes Series creation, Operations on Series DataFrames creation, Operations on Data frames Basic Indexing, using loc, iloc, Multi Indexing	Participants will learn how to work with Pandas data structures	4
13	Pandas	Boolean Indexing, Grouping of data Merging and joining data, pivots and reshaping data, groupby Data Manipulation using Pandas	Participants will learn how to work with Pandas data structures	4
14	Data analysis with Pandas	Exploratory data analysis Dealing with missing values Duplicates and dropping of columns Introduction to Object oriented programming concepts (OOPs)	Participants will learn Exploratory data analysis with Pandas	4
15	OOPs and Web scraping	Brief overview of Classes and objects, Abstraction, Polymorphism, Encapsulation, Inheritance Data Ingestion and Web scraping using Beautiful soup	Participants will get introduced to Object oriented programming and learn web scraping concepts	4
Total Duration				60