

# Advanced Python for Data Analytics Curriculum

## Module 1: NumPy and Pandas

### a. NumPy

- Introduction to Numpy
- Class and Attributes of ndarray
- Basic Operations
- Copy and Views
- Mathematical Functions of Numpy

### b. Pandas

- Introduction to Pandas
- Understanding Data Frame
- View and Select Data Demo
- Missing Values
- Data Operations
- File Read and Write Support
- Pandas SQL Operation

## Module 2: SciPy, Matplotlib, Seaborn

### a. SciPy

- Introduction to Pandas
- Understanding Data Frame
- View and Select Data Demo
- Missing Values
- Data Operations
- File Read and Write Support
- Pandas SQL Operation

### b. Matplotlib

- Plotting Histogram
- Bar Chart
- Pie Chart
- SubPlot

### c. Seaborn

- Numerical Data Plotting
- Line Plot
- Categorical Data Plotting
- Regression Plots

### **Module 3: Probability**

- Data types and its measures
- Random Variables, its application with variables
- Probability-Application with examples
- Probability distribution with examples
- Sampling Funnel- Why and How

### **Module 4: Statistics**

- What is statistics?
- Basic terminologies in statistics
- Types of statistics
- Descriptive statistics
- Measure of central tendency (mean, median, mode )
- Measures of dispersion (variance, standard deviation, range - its derivation )
- Inferential statistics

### **Module 5: Data Preparation**

- Is your data clean?
- What is Data Pre-Processing ?
- Handling Missing data
- Handling Categorical data
- Data cleaning techniques
- Outliers

### **Module 6: Exploratory Data Analysis**

- Introduction
- 2D Scatter-plot
- 3D Scatter-plot
- Univariate, Bivariate and Multivariate
- Histogram
- Box-plot
- Variance, Standard Deviation

### **Module 7: Case Studies**