DATA SCIENCE with Python

Introduction to Data Science:

- What is Data Science?
- What does data science involves
- Life cycle of Data Science
- Tools of Data Science

Introduction to python:

- What is Python and brief history?
- Why Python and who use Python
- Discussion on Python 2 and 3
- Unique features of Python
- Discussion on various IDE's
- Demonstration of practical use cases
- Python use cases using data analysis

Setup and Essentials :

- Introduction to python
- Software installation
- Write your first program in Python

Objects & Data structures :

- Introduction to Python objects
- Python built-in functions
- Number objects and operations
- Variable assignment and keywords, String objects and operations
- Print formatting with strings
- List objects and operations
- Tuple objects and operations
- Dictionary objects and operations
- Sets and Boolean
- Object and data structures
- Assessment test

Statements :

- If, elif and else statements
- Comparison operators
- Chained comparison operators
- What are loops
- For loops
- While loops
- Useful operator
- List comprehensions
- Statement assessment test
- Game challenge

Functions & Methods :

- What are various types of functions
- Creating and calling user defined functions
- Function practice exercises
- Lambda Expressions
- Map and filter
- Nested statements and scope
- Args and kwargs in Python
- Functions and methods assignment

File and exceptions Handling:

- Process files using python
- Read/write and append file object
- File functions
- File pointer and operations
- Introduction to error handling
- Try, except and finally
- Python standard exceptions
- User defined exceptions
- Unit testing
- File and exceptions assignment

Python inbuilt modules

- Creating UDM-User defined modules
- Passing command line arguments
- Writing packages
- Define PYTHONPATH
- __name__ and __main__

OOPs Concepts :

DATA SCIENCE with Python

- Object oriented features
- Implement object oriented programming with Python
- Creating classes and objects
- Creating class attributes
- Creating methods in a class
- Inheritance
- Polymorphism
- Special methods for class

Python Modues :

- Collections module
- Datetime
- Python debugger
- Timing your code
- Regular expressions
- StringIO
- Python decorators
- Python generators

Install packages on python :

- Introduction to pip, easy install
- Multithreading
- Multiprocessing

Machine Learning with Python :

- Understanding Machine Learning
- Scope of ML
- Supervised and Unsupervised learning

Mathematical Computing with Python
(Numpy)

- Introduction to Numpy :
- Introduction to numpy arrays
- How to Access Array Elements?
- Indexing, Slicing, Iteration, Indexing with Boolean Arrays
- Dealing with Flat □les using numpy
- Mathematical functions
- Statistical functions (mean, median, average, standard deviation)
- Operations with arrays
- Introduction to Scienti□c Computing (Scipy) :
- Save a search as a report
- Editing reports
- Creating reports with visualizations charts and tables
- Data Manipulation with Pandas
- Introduction to Pandas :
- De□ning data structures
- Understanding Dataframes
- Importing Data from various sources
- Csv, txt, excel etc)
- Missing values
- Data Operations
- File read operations
- Descriptive statistics

Data Visualization using Matplotlib :

- Create plots like scatter plot, histogram, bar graph, pie chart using Matplotlib Grids, axes, plots Markers, colour, fonts and styling.

Data Visualization using Tableau BI tool

- Comparison Between Tableau & Programming Based
- Data Visualization
- Need Of Tableau
- Types Of Data Sources Supported By Tableau For Report Development
- How To Build Report & Dashboard in Tableau
- How To Build Charts In Tableau
- Data Visualization Using Tableau Features

Machine learning Algorithms

DATA SCIENCE with Python

- Introduction to Data Science
- Introduction to Artificial Intelligence
- Introduction to Machine Learning
- Need of Machine learning in forecasting
- Demand of forecasting analytics in current industrial trends
- Introduction to Machine Learning Algorithms Categories
- Introduction to Natural Language Processing (NLP)
- : **Linear Regression with Python**
- Introduction to Regression
- Exercise on Linear Regression using Scikit Learn Library
- Project on Linear regression using USA_HOUSING data
- Evaluation of Linear regression using python visualizations
- Practice project for Linear regression using advertisement data set to predict appropriate advertisements for users.
- :**K- Nearest neighbours using Python**
- Exercise on K-Nearest neighbors using Sci-kit Learn Library
- Project on Logistic regression using Dogs and horses' dataset
- Getting the correct number of clusters
- Evaluation of model using confusion matrix and classification report
- Standard scaling problem
- Practice project on KNN algorithm.

Introduction to Deep Learning

- Neural Network and Deep Learning
- What is TensorFlow?
- TensorFlow Installation
- TensorFlow basics
- TensorFlow with Contrib Learn
- TensorFlow Exercise
- What is Keras?
- Keras Basics
- Pipeline implementation using Keras
- MNIST implementation with Keras

API with Flask /Django and Python

- REST principles
- Creating application endpoints
- Implementing endpoints
- Using Postman for API testing

API Integration with Database for Web Development

- CRUD operations on database
- REST principles and connectivity to databases
- Creating a web development API for login registers and connecting it to the database
- Deploying the API on a local server

Main Project:

- **Assignment and Live Examples**
- **Case studies**

Duration: 3 Months