

## Course Name: Certificate Course in Data Science with Python

**Course Objective:** The objective of this course is to create expertise in Python Programming to develop data science applications.

**Prerequisite:** Candidates should be proficient in Computer Fundamentals, Database and Programming concepts with logical approach.

### Detailed Course Contents

#### Fundamentals of Data Science

- Introduction to Data Science, Basic Terminology
- Data Science Venn Diagram
- Explore the Data, Model the Data
- Case Studies

#### Programming Concepts

- **Introduction to Python:** Basic Syntax, Data Types, Variables, Operators, Input/output, Flow of Control (Modules, Branching), If, If- else, Nested if-else, Looping, For, While, Nested loops, Control Structure, Break, Continue, Pass, Strings and Tuples, Accessing Strings, Basic Operations, String slices, Working with Lists, Introduction, Accessing list, Operations, Function and Methods, Files, Modules, Dictionaries, Functions and Functional Programming, Declaring and calling Functions, Declare, assign and retrieve values from Lists, Introducing Tuples, Accessing tuples, matplotlib, seaborn,
- **Advanced Python:** Object Oriented, OOPs concept, Class and object, Attributes, Inheritance, Overloading, Overriding, Data hiding, Operations Exception, Exception Handling, Except clause, Try finally clause, User Defined Exceptions, Python Libraries, Data Pre-processing,
- **Data migration and visualization:** Pandas and Matplotlib ,Database Interaction in Python, Data manipulation, Data Analysis & visualization – using numpy, matplotlib, scipy, Advanced python packages, Mathematical computing with Python,
- **IDE:** Pycharm Anaconda , Case Study

#### List of Text/Reference Books

- Introduction to Computer Science using Python by Charles Dierbach

#### Requirements (S/W and H/W)

- Python 3.5 or Higher
- IDE
  - Anaconda
  - PyCharm
  - Spyder