# **Python Detailed Course Contents**

- What is Python?
- WHY PYTHON?
- History
- Features Dynamic, Interpreted, Object oriented, Embeddable, Extensible, Large standard libraries, Free and Open source
- Why Python is General Language?
- Limitations of Python
- What is PSF?
- Python implementations
- Python applications
- Python versions
- PYTHON IN REALTIME INDUSTRY
- Difference between Python 2.x and 3.x
- Difference between Python 3.7 and 3.8
- Software Development Architectures

## Python Language Fundamentals

- Python Implementation Alternatives/Flavors
- Keywords
- Identifiers
- Constants / Literals
- Data types
- Python VS JAVA
- Python Syntax

## Different Modes of Python

- Interactive Mode
- Scripting Mode
- Programming Elements
- Structure of Python program
- First Python Application
- Comments in Python
- Python file extensions
- Setting Path in Windows
- Edit and Run python program without IDE
- Edit and Run python program using IDEs
- INSIDE PYTHON
- Programmers View of Interpreter
- Inside INTERPRETER
- What is Byte Code in PYTHON?
- Python Debugger

## Python Variables

- bytes Data Type
- byte array
- String Formatting in Python

- Math, Random, Secrets Modules
- Introduction
- Initialization of variables
- Local variables
- Global variables
- 'global' keyword
- Input and Output operations
- Data conversion functions int(), float(), complex(), str(), chr(), ord()

#### Operators

- Arithmetic Operators
- Comparison Operators
- Python Assignment Operators
- Logical Operators
- Bitwise Operators
- Shift operators
- Membership Operators
- Identity Operators
- Ternary Operator
- Operator precedence
- Difference between "is" vs "=="

## Input & Output Operators

- Print
- Input
- Command-line arguments

#### **Control Statements**

- Conditional control statements
- If
- If-else
- If-elif-else
- Nested-if
- Loop control statements
- for
- while
- Nested loops
- Branching statements
- Break
- Continue
- Pass
- Return
- Case studies

## Data Structures or Collections

- Introduction
- Importance of Data structures
- Applications of Data structures

- Types of Collections
- Sequence
- Strings, List, Tuple, range
- Non sequence
- Set, Frozen set, Dictionary
- Strings
- What is string
- Representation of Strings
- Processing elements using indexing
- Processing elements using Iterators
- Manipulation of String using Indexing and Slicing
- String operators
- Methods of String object
- String Formatting
- String functions
- String Immutability
- Case studies

#### List Collection

- What is List
- Need of List collection
- Different ways of creating List
- List comprehension
- List indices
- Processing elements of List through Indexing and Slicing
- List object methods
- List is Mutable
- Mutable and Immutable elements of List
- Nested Lists
- List\_of\_lists
- Hardcopy, shallowCopy and DeepCopy
- zip() in Python
- How to unzip?
- Python Arrays:
- Case studies

## **Tuple Collection**

- What is tuple?
- Different ways of creating Tuple
- Method of Tuple object
- Tuple is Immutable
- Mutable and Immutable elements of Tuple
- Process tuple through Indexing and Slicing
- List v/s Tuple
- Case studies

## Set Collection

- What is set?
- Different ways of creating set

- Difference between list and set
- Iteration Over Sets
- Accessing elements of set
- Python Set Methods
- Python Set Operations
- Union of sets
- functions and methods of set
- Python Frozen set
- Difference between set and frozenset?
- Case study

#### Dictionary Collection

- What is dictionary?
- Difference between list, set and dictionary
- How to create a dictionary?
- PYTHON HASHING?
- Accessing values of dictionary
- Python Dictionary Methods
- Copying dictionary
- Updating Dictionary
- Reading keys from Dictionary
- Reading values from Dictionary
- Reading items from Dictionary
- Delete Keys from the dictionary
- Sorting the Dictionary
- Python Dictionary Functions and methods
- Dictionary comprehension

## **Functions**

- What is Function?
- Advantages of functions
- Syntax and Writing function
- Calling or Invoking function
- Classification of Functions
- No arguments and No return values
- With arguments and No return values
- With arguments and With return values
- No arguments and With return values
- o Recursion
- Python argument type functions :
- Default argument functions
- Required(Positional) arguments function
- Keyword arguments function
- Variable arguments functions
- 'pass' keyword in functions
- Lambda functions/Anonymous functions
- o map()
- o filter()
- o reduce()
- Nested functions
- Non local variables, global variables
- Closures

- Decorators
- Generators
- Iterators
- Monkey patching