

'Core & Ad. Python' Language -Syllabus

GETTING STARTED

- History & need of Python
- Application of Python
- Advantages of Python
- Disadvantages of Python
- Installing Python
- Program structure
- Interactive Shell
- Executable or script files.
- User Interface or IDE

PYTHON FUNDAMENTALS

- Working with Interactive mode
- Working with Script mode
- Python Character Set
- Python Tokens, Keywords, Identifiers, Literals, Operators
- Variables and Assignments
- Input and Output in Python

OPERATORS

- Arithmetic Operators
- Relational Operators
- Logical Operators
- Membership Operators
- Identity Operators
- Bitwise Operators
- Assignment Operators
- Operators Precedence
- Evaluating Expression
- Type Casting

DATA HANDLING

- Data Types Numbers → Strings → Lists → Tuples → Dictionary → Set → Frozenset → Bool → Mutable and Immutable

STRING MANIPULATION

- Introduction to Python String
- Accessing Individual Elements
- String Operators
- String Slices
- String Functions and Methods

LIST MANIPULATION

- Introduction to Python List
- Creating List
- Accessing List
- Joining List
- Replicating List
- List Slicing

TUPLES

• Introduction to Tuple • Creating Tuples • Accessing Tuples • Joining Tuples • Replicating Tuples • Tuple Slicing

DICTIONARIES

• Introduction to Dictionary • Accessing values in dictionaries • Working with dictionaries • Properties

SET AND FROZENSET • Introduction to Set and Frozenset • Creating Set and Frozenset • Accessing and Joining • Replicating and Slicing

PROGRAM CONTROL FLOW

• **Conditional Statements** → The if Statement → The if-else Statement → The if-elif Statement → Nested if Statements → Python Indentation

Looping and Iteration → The For Loop → The While Loop → Loop else Statement → Nested Loops → Break and Continue

• **The Range Function** → Introduction to range() → Types of range() function → Use of range() function

INTRODUCTION TO FUNCTIONS

• Built-In Functions → Introduction to Functions → Using a Functions → Python Function Types → Structure of Python Functions → E.g. - map, zip, reduce, filter, any, chr, ord, sorted, globals, locals, all, etc

User Defined Functions → Structure of a Python Program w.r.t. UDF → Types of Functions → Invoking UDF → Flow of Execution → Arguments and Parameters → Default Arguments, Named Arguments → Scope of Variables → Lambda function • Recursion Function → Use of recursion function

MODULES AND PACKAGES

- Built-in Modules → Importing Modules in Python Programs → Working with Random Modules → E.g. - builtins, os, time, datetime, calendar, sys, etc.
- User Defined Functions → Structure of Python Modules

FILE OPERATIONS

- Text and Bytes files → Opening a file → Reading and Writing Files → Other File tools

MS Excel files and Other → Introduction to MS Excel files, CSV files.

INTRODUCTION TO OOPS

- Procedural Vs Modular Programming
- The Object Oriented Programming
- Data Abstraction
- Data Hiding
- Encapsulation
- Modularity
- Inheritance
- Polymorphism

CLASSES AND OBJECTS

- Classes as User Defined Data Type
- Objects as Instances of Classes
- Creating Class and Objects
- Creating Objects By Passing Values
- Variables & Methods in a Class

EXCEPTION HANDLING

- Default Exception and Errors
- Catching Exceptions
- Raise an exception
- Try.... except statement
- Raise, Assert, Finally blocks
- User defined exception

REGULAR EXPRESSIONS.

- Match function
- Search function
- Grouping
- Matching at Beginning or End
- Match Objects
- Flags

TURTLE PROGRAMMING

- Introduction to Turtle
- Controlling Turtle
- Animation Programming

MULTITHREADING

- Thread and Process
- Starting a thread
- Threading module
- Synchronizing threads
- Multithreaded Priority Queue

NETWORKING

- Socket Module
- Server-client-socket
- Connecting client server
- Client-server chatting program

Misc.

- Decorators
- Generators
- Iterators etc.

DATABASE

- Introduction to MySQL
- PYMYSQL Connections
- Executing queries
- Transactions
- Handling error

GUI PROGRAMMING

- Introduction
- Tkinter programming
- Tkinter widgets
- Frame
- Button
- Label
- Entry

Projects:

1. Console Project
2. GUI Project

➔ **Note :- More than 200 programs will be practiced during the course.**

Popular IDE/Editor for 'Python' language

- IDLE(BY DEFAULT)
- PyCharm
- VS Code
- Sublime Text3
- Atom
- Jupyter etc.