

**CETPA INFOTECH PVT. LTD.**  
**CURRICULUM OF CORE AND ADVANCED PYTHON**

**6-weeks & 2-months\***

**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

**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

**OPERATORS**

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

**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 Modules**
  - Structure of Python Modules

**FILE OPERATIONS**

- **Text and Bytes files**
  - Opening a file
  - Reading and Writing Files
  - Other File tools
- **MS Excel files**
  - Introduction to MS Excel files

**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

<p><b><u>EXCEPTION HANDLING</u></b></p> <ul style="list-style-type: none"> <li>• Default Exception and Errors</li> <li>• Catching Exceptions</li> <li>• Raise an exception</li> <li>• Try.... except statement</li> <li>• Raise, Assert, Finally blocks</li> <li>• User defined exception</li> </ul> <p><b><u>INTRODUCTION TO OOPS</u></b></p> <ul style="list-style-type: none"> <li>• Procedural Vs Modular Programming</li> <li>• The Object Oriented Programming</li> <li>• Data Abstraction</li> <li>• Data Hiding</li> <li>• Encapsulation</li> <li>• Modularity</li> <li>• Inheritance</li> <li>• Polymorphism</li> </ul> <p><b><u>DATABASE</u></b></p> <ul style="list-style-type: none"> <li>• Introduction to MySQL</li> <li>• PYMYSQL Connections</li> <li>• Executing queries</li> <li>• Transactions</li> <li>• Handling error</li> </ul>	<p><b><u>GUI PROGRAMMING</u></b></p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Tkinter programming</li> <li>• Tkinter widgets</li> <li>• Frame</li> <li>• Button</li> <li>• Label</li> <li>• Entry</li> </ul> <p><b><u>TURTLE PROGRAMMING</u></b></p> <ul style="list-style-type: none"> <li>• Introduction to Turtle</li> <li>• Controlling Turtle</li> <li>• Animation Programming</li> </ul> <p><b><u>MULTITHREADING</u></b></p> <ul style="list-style-type: none"> <li>• Thread and Process</li> <li>• Starting a thread</li> <li>• Threading module</li> <li>• Synchronizing threads</li> <li>• Multithreaded Priority Queue</li> </ul> <p><b><u>NETWORKING*</u></b></p> <ul style="list-style-type: none"> <li>• Socket Module</li> <li>• Server-client-socket</li> <li>• Connecting client server</li> <li>• Client-server chatting program</li> </ul>	<p><b><u>REGULAR EXPRESSIONS*</u></b></p> <ul style="list-style-type: none"> <li>• Match function</li> <li>• Search function</li> <li>• Grouping</li> <li>• Matching at Beginning or End</li> <li>• Match Objects</li> <li>• Flags</li> </ul> <p><b><u>ADVANCED CONCEPTS*</u></b></p> <ul style="list-style-type: none"> <li>• Decorators</li> <li>• Generators</li> <li>• Iterators</li> <li>• Co-routines</li> </ul> <p><b><u>CGI*</u></b></p> <ul style="list-style-type: none"> <li>• Architecture</li> <li>• CGI environment variable</li> <li>• GET and POST methods</li> <li>• Cookies</li> <li>• File upload</li> </ul> <p><b><u>Standard Library References</u></b></p> <p><b><u>Projects:</u></b></p> <ol style="list-style-type: none"> <li><b><u>1. Console Project</u></b></li> <li><b><u>2. GUI Project</u></b></li> </ol>
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<p><b><u>HEAD OFFICE:</u></b></p> <p><b><u>CORPORATE OFFICE:</u></b></p> <p><b><u>BRANCH OFFICE:</u></b></p> <p><b><u>BRANCH OFFICE:</u></b></p>	<p>200 Purwavali , 2nd Floor, (Opp. Railway Ticket Agency), Railway Road , Ganeshpur, Roorkee – 247667, Ph. No.: 09219602769, 01332-270218, Fax - 1332 – 274960</p> <p>D-58, Sector-2, Near Red FM. Noida -201301, Uttar Pradesh Contact Us: +91-9212172602 , 0120-4535353</p> <p>401 A, 4<sup>th</sup> Floor, Lekhraj Khazana, Faizabad Road, Indira Nagar, Lucknow-220616 (U.P.) Ph. No: +91-522-6590802, +91-9258017974</p> <p>105, Mohit Vihar, Near Kamla Palace, GMS Road, Dehradun-248001, UK Contact: +91-9219602771, 0135-6006070</p> <p><b>Toll Free- 1800-8333-999 (from any network)</b></p>	 <p><b><i>Because Knowledge Matters</i></b></p> <p><b>ISO 9001:2015 Certified</b></p>
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