

Certificate Course in Python Programming (Core Python)

Course Duration: 2 Months

Course Overview

The **Certificate Course in Python Programming (Core Python)** is designed to provide students with a solid foundation in **Python programming**, one of the most popular and versatile programming languages. The course focuses on **core Python concepts, data types, control structures, functions, object-oriented programming, file handling, and exception handling**.

Learners will gain hands-on experience in **writing, debugging, and executing Python programs** and develop problem-solving skills required for **software development, web development, data analysis, and automation**.

This course is ideal for **students, IT enthusiasts, and beginners in programming** who want to start a career in software development or enhance their coding skills.

Course Objectives

By the end of this course, learners will be able to:

1. Understand the **fundamentals of Python programming and its syntax**.
 2. Develop skills to **write, debug, and execute Python programs**.
 3. Apply **control structures, loops, and decision-making statements** effectively.
 4. Understand and implement **functions, modules, and packages**.
 5. Work with **file handling, exception handling, and data structures**.
 6. Apply **object-oriented programming concepts in Python**.
 7. Prepare for **advanced Python programming and application development**.
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Course Outcomes

After completing this course, students will be able to:

1. Write **Python programs using variables, operators, and control statements**.
2. Implement **loops and conditional statements** to solve programming problems.
3. Develop **functions, modules, and reusable code** in Python.

4. Work with **lists, tuples, dictionaries, and sets** to manage data efficiently.
 5. Handle **files and exceptions** in Python programs.
 6. Apply **object-oriented programming concepts** such as classes, objects, inheritance, and polymorphism.
 7. Build a foundation for **advanced Python programming, data analysis, automation, and web development**.
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Course Syllabus (Module-Wise)

Module 1: Introduction to Python

- Overview of Python – Features & Applications
 - Setting up Python Environment (IDE, Anaconda, Jupyter)
 - Writing and Running Python Programs
 - Python Syntax, Indentation, Comments
 - Variables, Constants, and Data Types
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Module 2: Operators & Expressions

- Arithmetic, Relational, Logical Operators
 - Assignment, Bitwise, and Membership Operators
 - Type Conversion & Type Casting
 - Expressions & Operator Precedence
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Module 3: Control Structures

- Conditional Statements: if, if-else, if-elif-else
 - Loops: for, while
 - Nested Loops
 - break, continue, pass Statements
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Module 4: Functions, Modules & Packages

- Defining and Calling Functions

- Function Parameters and Return Values
 - Lambda Functions & Recursion
 - Python Modules and Packages
 - Importing Standard Libraries
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Module 5: Data Structures in Python

- Lists, Tuples, Sets, and Dictionaries
 - Operations on Data Structures
 - Iteration & Comprehensions
 - Practical Programs using Data Structures
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Module 6: Object-Oriented Programming in Python

- Classes and Objects
 - Attributes and Methods
 - Constructors (**init**) and Destructors
 - Inheritance, Polymorphism, and Encapsulation
 - Practical Programs using OOP Concepts
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Module 7: File Handling & Exception Handling

- Reading and Writing Text Files
 - File Modes (r, w, a, r+)
 - Working with CSV and JSON files
 - Exception Handling – try, except, finally, raise
 - Practical Programs on Files & Exceptions
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Module 8: Practical Projects & Assessment

- Mini Projects: Student Management, Banking System, Inventory Management
- Combining OOP, Data Structures, Functions, and File Handling

- Debugging and Testing Programs
 - Final Assessment & Certification
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☒ **Teaching Methodology:** 70% Practical + 30% Theory

☒ **Outcome:** Students will gain **hands-on experience in Python programming**, enabling them to develop **real-world applications and prepare for advanced Python learning, automation, data analysis, or software development roles.**