

Certificate Course in Advance Python Programming (CCAPP)

Duration – 2 Months

Course Overview

The **Certificate Course in Advance Python Programming** is designed for learners who already have a foundation in core Python and want to advance their skills. The course covers advanced programming concepts, libraries, and tools widely used in real-world applications, including data handling, database connectivity, GUI development, web frameworks, and data visualization. By the end of the course, students will be able to build advanced Python applications suitable for professional and entrepreneurial use.

Course Objectives

The course aims to:

1. Enhance knowledge of **advanced Python concepts** including iterators, generators, and decorators.
 2. Provide hands-on training in **file handling, database connectivity, and data processing**.
 3. Develop skills to create **GUI-based applications** using Tkinter.
 4. Introduce **web development concepts** using Flask/Django framework basics.
 5. Explore **data visualization and analysis tools** such as Pandas, Matplotlib, and NumPy.
 6. Enable students to implement **mini-projects** applying advanced Python techniques.
-

Course Outcomes

Upon successful completion of the course, learners will be able to:

- Apply **advanced programming constructs** such as iterators, generators, and decorators.
- Handle **data files (CSV, JSON, Excel)** and **connect Python with databases (MySQL/SQLite)**.
- Develop **GUI-based applications** for practical business and personal use.
- Build and deploy **basic web applications** using Python frameworks.
- Use **Python libraries** for data analysis and visualization.

- Undertake **real-world projects**, preparing them for career opportunities in software development, data analytics, and web programming.
-

Course Syllabus (Module-Wise)

Module 1: Advanced Python Concepts

- Iterators and Generators
- Decorators and Closures
- Advanced Functions (map, filter, reduce, zip)
- Regular Expressions

Module 2: File Handling & Database Connectivity

- Handling CSV, JSON, and Excel files
- Python with MySQL/SQLite (CRUD Operations)
- Practical database-driven programs

Module 3: Object-Oriented Programming (Advanced)

- Class methods & static methods
- Operator overloading
- Abstract classes & Interfaces (abc module)
- Exception Handling (Advanced)

Module 4: GUI Programming (Tkinter)

- Introduction to Tkinter
- Widgets (Labels, Buttons, Entry, Frames, Menus)
- Event handling
- Building a simple desktop application

Module 5: Web Development Basics

- Introduction to Flask Framework
- Routing, Templates, Forms
- Mini Web Application (Student Registration / Login System)

Module 6: Data Analysis & Visualization

- NumPy – Arrays, Operations
- Pandas – Series, DataFrames, Import/Export Data
- Matplotlib – Line, Bar, Pie, Histogram Charts
- Case Study: Data Visualization Project

Module 7: Mini Project & Assessment

- Students develop a **mini-project** integrating advanced Python concepts.
 - Example Projects: Inventory Management, Student Result Analysis, Expense Tracker, Basic Web App.
- Final assessment & project presentation.

 **Duration:** 2 Months  **Mode:** Theory + Practical (Hands-on focus)