Welcome to

Python Programming Course

Milestone Jan - Jun 2025

COURSE OBJECTIVES

The objective of the **Python Programming Course** is to provide a comprehensive understanding of programming using Python. Students will learn key concepts such as data structures, algorithms, object-oriented programming, and web development with Python. The course will cover essential tools and technologies such as Python, SQL/MySQL, Visual Studio Code, XAMPP server, and Git/GitHub. Additionally, students will gain proficiency in using flask framework, understand MySQL and SQLite database operations, and essential software development techniques to develop secure and efficient applications. The course includes hands-on projects to reinforce learning and concludes with a final project that integrates all acquired skills, preparing students to develop functional and secure applications.

CAREER OBJECTIVES

The career objective of the **Python Programming Course** is to equip students with the essential skills and knowledge required to excel in various programming roles. Upon completion, students will be prepared for roles such as Python Developer, Software Engineer, Data Analyst, Data Scientist, or Web Application Developer, Desktop Application Developer, Software Security Engineer. The comprehensive curriculum ensures that students can confidently utilize key technologies and tools, implement secure and efficient applications, and understand the full software development lifecycle. This foundation will enable them to pursue career opportunities in various industries, contribute to innovative projects, and adapt to the evolving demands of the tech industry.

TOOLS REQUIRED

For student to complete and participate in this course, the following tool are required:

1. Must have Laptop/Desktop Computer
2. Must have Wi-Fi / Data
3. Visual Studio Code Installed
4. Pycharm installed
5. XAMPP installed
6. Git installed
7. Ability to use Google Meet

RESOURSES/MATERIALS AND ASSESSESSMENTS

1. Learning materials (Notes or Video provided)
2. Assignments, Assessment and Projects

WEEKLY COURSE OUTLINE

WEEK 1

Introduction to software engineering & application development

- Software engineering & application development
- Software engineering principles (modularity, abstraction, version control, security, testing and, documentation.
- Software development methodologies (waterfall, agile, spiral, prototype)
- Software project development processes (requirements gathering, design, implementation, testing, maintenance)
- Quiz/Assignment/Assessment

WEEK 2

Python Programming Introduction

- An overview of python
- Comparison of python programming language with other languages
- Advantages and disadvantages of Python programing language
- Setting up Python environment
  - Python setup download and installation
  - Setting up command prompt for Python for windows OS
  - Setting up Python for Visual Studio Code IDE
  - Creating virtual environment in windows system
- Quiz/Assignment/Assessment

WEEK 3

Getting Started with Python Programming

- Writing first program in Python
- Understand of syntax and structure
- Understand of keywords, comments, variables, data types
- Understand of indentation in python
- Quiz/Assignment/Assessment

WEEK 4

Learning Python input/output

- Understand print() function
- Understand f-string() function
- Print elements on same line & newline
- Python end paramenter in print() function
- Python sep paramenter in print() function
- Python Output formatting
- Input taking in Python
- Multiple Inputs taking from users
- Quiz/Assignment/Assessment

Operators in Python

- Brief description of Operators and their importance
- Arithmetic operator and importance
- Comparison operator and importance
- Logical operator and importance
- Assignment operator and importance
- Bitwise operator and importance
- Quiz/Assignment/Assessment

WEEK 5

Conditional Statements in Python

- Brief description of Conditional Statements in Python and their importance
- If else statement and importance
- Nested if statement and importance
- Python if else Ladder and importance
- Match case statement and importance
- Quiz/Assignment/Assessment

Loops in Python

- Overview of Loops in Python and their importance
- For Loop and importance
- While Loop and importance
- Python if else Ladder and importance
- Loop Control statement (break, continue) and importance
- Quiz/Assignment/Assessment

WEEK 6

Project 1

WEEK 7

Functions in Python

- Understand the concept of functions
- Learn how to define and call functions
- Explore the use of parameters and return values
- Study different types of functions (e.g., built-in, user-defined, lambda)
- Quiz/Assignment/Assessment

WEEK 8

Project 2

WEEK 9

Concepts of OOPs in Python

- Overview of Python classes and objects
- Polymorphism
- Inheritance
- Abstraction
- Encapsulation
- Iterators
- Quiz/Assignment/Assessment

WEEK 10

Exception Handling in Python

- Overview of file handling
- Python read files
- How to create/write files
- Understand built-in exception
- Understand try and exception handling
- Quiz/Assignment/Assessment

WEEK 11

Packages or Libraries in Python

- Overview of built-in modules in Python
- Introduction to Data Structures Algorithms Libraries
- Introduction to Machine learning
- Introduction to Graphical User Interface(GUI) libraries
- Introduction to Game development packages
- Introduction to Web Application Frameworks
- Quiz/Assignment/Assessment

WEEK 12

Desktop Application (GUIs in Python using Tkinter)

- Introduction to Tkinter
- Components and Events
- GUI overview
- The root component
- Tables and forms
- Adding buttons
- Widgets
- Check buttons
- Building your desktop application
- Quiz/Assignment/Assessment

WEEK 11

Web Applications using Flask Framework

- Introduction to Flask
- Installation guide
- Project and application creation
- Folders and files structure
- Creating first web page
- Libraries importation
- Forms authentication

WEEK 12

Database Access in Python

- Understand SQLite database.
- Installation SQLite Database
- DB Connection
- DDL commands (create, alter, trop, truncate, rename)
- DML commands (select, insert, update, delete)

Week 13

Web application Security Techniques

- Brief description of web application security and its importance
- Different type of hackers and their motivation and cyber threads
- Overview of secure communication, access logs and monitoring, secure authentication and authorization
- Secure coding practices
- Penetration testing
- Encryption for Data Protection
- Understand ways of input validation and sanitization (to prevent SQL injection, other injection attacks)

Week 14

Recap

Week 15

FINAL PROJECT

GOOD LUCK!!!