

**Introduction to Python**

Duration: 4 Days

Description

This course is a comprehensive four-day program designed to teach Python programming. It covers a range of topics including Python basics, data types, collections, functions, object-oriented programming, modules, exception handling, file management, and database access. The course is structured into nine modules, each focusing on a specific aspect of Python with hands-on labs in each module.

Audience

This course is well-suited for those looking to enhance their programming skills and understanding of Python for application development and data management tasks.

Objectives

In this Python course, you will learn how to:

* Efficiently develop Python applications by utilizing built-in functions and data structures.
* Apply object-oriented principles to structure your code, incorporating modules and classes.
* Demonstrate proficiency in working with functions and collections through practical exercises.
* Utilize external libraries to extend functionalities and manage various data formats effectively.
* Acquire hands-on experience in file and data handling within the Python environment.
* Develop comfort and competence in dealing with Exceptions through practical exception handling exercises.

Prerequisites

This course requires:

* Basic knowledge in a procedural or object-oriented language like C, C++, Java, or SQL
* Understanding of fundamental programming concepts such as variables, loops, and use of a text editor for coding

Outline

* Module 1: Python Introduction
  + Background, Uses, and Characteristics
  + Syntax and Writing Basic Code
  + Data Types and Variables
  + Operators
* Module 2: Control Structures
  + Conditional Statements
    - **if**
    - **else**
    - **elif**
  + Loops
    - **for**
    - **while**
  + Loop Control Statements
    - **break**
    - **continue**
    - **pass**
  + Nested Control Structures
* Module 3: Collections
  + Lists
  + Tuples
  + Dictionaries
  + Sets
  + Membership Testing
  + Iterate Collections
  + List Comprehensions
* Module 4: Functions
  + Create Functions Using **def** Keyword
  + Arguments
    - Positional
    - Keyword
    - Default
    - Variable-Length
  + Return Statements
  + Scope and Lifetime of Functions
  + Anonymous/Lambda Functions
  + Higher Order Functions
* Module 5: Object-Oriented Programming with Python
  + Basic Concepts of Object Oriented Programming
    - Classes
    - Objects
    - Inheritance
    - Encapsulation
    - Polymorphism
  + Creating Classes and Instantiating Objects
  + Instance Methods
  + Class Variables and Instance Variables
  + Inheritance and Subclassing
* Module 6: Python Modules
  + Concept and Purpose of Modules in Python
  + Creating and Using Modules
  + **import** Statement
  + Built-In Modules
  + **sys** and **os** Modules
  + Creating Custom Modules
* Module 7: Exceptions
  + Exceptions vs. Syntax Errors
  + Exception Handling
    - **try** Block
    - **except** Block
    - **else** Clause
    - **finally** Block
  + Multiple Exception Handling
  + Raising Exceptions
  + Custom Exception Classes
* Module 8: Files
  + File Operations
    - Open
    - Read
    - Write
    - Close
  + File Modes
    - Read(**r**)
    - Write(**w**)
    - Append(**a**)
  + File Iteration
  + Streams
* Module 9: Relational Databases
  + Database Connection
  + SQL Basics
  + Database Libraries
  + Cursor Object