ZYTRIX TRAINING

Build your skills for Brighter Future

Python programming Syllabus

Module 1: Introduction to Python

Introduction to Python programming language

Features and advantages of Python

Installing Python and setting up the development environment (Anaconda, Jupyter Notebook)

Running Python scripts and interactive mode

Module 2: Python Basics

Understanding Python syntax and indentation

Python identifiers, keywords, and comments

Variables, data types, and type conversion

Basic input/output operations

Operators and expressions

Module 3: Control Structures

Conditional statements (if, elif, else)

Loops (for loop, while loop)

Loop control statements (break, continue)

Looping through sequences (lists, tuples, strings)

Module 4: Data Structures Part I - Lists

Introduction to lists

Creating lists, accessing elements, and slicing lists

Modifying lists (appending, inserting, removing, extending)

List methods and functions (len(), min(), max(), sum())

Module 5: Data Structures Part II - Tuples

Introduction to tuples

Creating tuples, accessing elements, and tuple packing/unpacking

Immutability of tuples

Tuple methods and functions (count(), index())

Module 6: Data Structures Part III - Dictionaries

Introduction to dictionaries

Creating dictionaries, accessing elements, and dictionary methods

Dictionary operations and looping through dictionaries

Using dictionaries for data manipulation and storage

Module 7: Data Structures Part IV - Sets

Introduction to sets

Creating sets, set operations, and set methods

Set comprehension

Applications of sets in Python programming

Module 8: Functions

Introduction to functions

Defining and calling functions

Function arguments (positional, keyword, default, variable-length)

Scope and lifetime of variables

Recursive functions

Module 9: File Handling

Working with files in Python

Opening and closing files

Reading from and writing to files

File modes (read, write, append)

Handling file exceptions (try-except blocks)

Module 10: Object-Oriented Programming (OOP)

Introduction to object-oriented programming (OOP)

Classes and objects

Constructors and destructors

Inheritance and polymorphism

Encapsulation and abstraction

Module 11: Error Handling and Debugging

Understanding exceptions

Handling exceptions with try-except blocks

Raising exceptions

Debugging techniques (print statements, debugging tools)

Module 12: Modules and Packages

Introduction to modules and packages

Creating and importing modules

Creating and installing packages

Using third-party libraries and modules (e.g., NumPy, pandas, Matplotlib)

Module 13: Advanced Topics

List comprehensions and generator expressions

Decorators and function decorators

Context managers (with statement)

Regular expressions (re module)

Module 14: Introduction to Data Science with Python

Overview of data science and its applications

Introduction to NumPy and arrays

Introduction to pandas and dataframes

Data visualization with Matplotlib and Seaborn

Module 15: Introduction to Machine Learning with Python

Overview of machine learning

Supervised learning vs. unsupervised learning

Introduction to scikit-learn

Building and evaluating machine learning models (classification, regression)

Module 16: Project Work

Students work on a real-world project using Python, incorporating concepts learned throughout the course

Module 17: Best Practices and Coding Standards

Writing clean, readable, and maintainable code

PEP 8 guidelines and coding standards

Documentation and comments