BRIGHT INFOTECH

Python Course Details

1. Introduction to Python

- **What is Python?**
  - Overview of Python
  - History of Python
  - Features and Benefits
- **Setting Up the Environment**
  - Installing Python
  - Using an IDE (PyCharm, VS Code)
  - Writing and running your first Python script

2. Python Basics

- **Syntax and Semantics**
  - Writing and Executing Python Programs
  - Python Syntax and Indentation
- **Basic Data Types**
  - Numbers (int, float, complex)
  - Strings
  - Booleans
- **Variables and Operators**
  - Declaring Variables
  - Arithmetic, Comparison, Logical, and Assignment Operators

3. Control Flow

- **Conditional Statements**
  - if, elif, else Statements
- **Loops**
  - for Loops
  - while Loops
  - Loop Control Statements (break, continue, pass)

4. Functions

- **Defining Functions**
  - Function Syntax
  - Parameters and Arguments

    - Return Values
- **Advanced Functions**
    - Default Parameters
    - Variable-Length Arguments
    - Lambda Functions

5. Data Structures

- **Lists**
    - Creating and Accessing Lists
    - List Methods
    - List Comprehensions
- **Tuples**
    - Creating and Accessing Tuples
    - Tuple Methods
- **Dictionaries**
    - Creating and Accessing Dictionaries
    - Dictionary Methods
- **Sets**
    - Creating and Accessing Sets
    - Set Methods

6. Modules and Packages

- **Modules**
    - Importing Modules
    - Creating Your Own Modules
- **Packages**
    - Installing Packages using pip
    - Importing and Using Packages

7. File Handling

- **Reading and Writing Files**
    - Opening and Closing Files
    - Reading from Files
    - Writing to Files
- **Working with Different File Formats**
    - CSV Files
    - JSON Files

8. Error Handling

- **Exception Handling**
    - try, except, finally Blocks
    - Handling Multiple Exceptions
- **Raising Exceptions**
    - Using raise Keyword

    - Creating Custom Exceptions

9. Object-Oriented Programming (OOP)

- **Classes and Objects**
    - Defining Classes
    - Creating Objects
- **Attributes and Methods**
    - Instance and Class Attributes
    - Defining Methods
- **Inheritance and Polymorphism**
    - Inheriting Classes
    - Method Overriding
    - Using super()
- **Encapsulation and Abstraction**
    - Private and Protected Members
    - Abstract Classes and Methods

10. Advanced Topics

- **Decorators**
    - Function Decorators
    - Class Decorators
- **Generators**
    - Creating Generators
    - Using yield Keyword
- **Context Managers**
    - Using with Statement
    - Creating Custom Context Managers

11. Working with Libraries

- **NumPy for Numerical Computations**
    - Arrays and Array Operations
    - Basic Mathematical Functions
- **Pandas for Data Analysis**
    - DataFrames and Series
    - Reading and Writing Data
    - Data Manipulation
- **Matplotlib for Data Visualization**
    - Plotting Graphs
    - Customizing Plots

12. Web Development with Python

- **Introduction to Flask**
    - Setting Up Flask
    - Creating Routes

    - Rendering Templates
- **Introduction to Django**
    - Setting Up Django
    - Creating Django Projects and Apps
    - Working with Models and Views

13. Data Science and Machine Learning

- **Introduction to Data Science**
    - Data Analysis Workflow
    - Cleaning and Preparing Data
- **Introduction to Machine Learning**
    - Basic Concepts
    - Using Scikit-Learn for Machine Learning Tasks

14. Project Work

- **Building Real-World Projects**
    - Choose a Project Topic
    - Plan and Develop the Project
    - Present the Project