

PEN220 - Introduction to Python

Syllabus

Week 1: Overview of Python

- Including its history and applications
- Installation of Python and setting up the development environment
- Basic syntax: variables, data types (integers, floats, strings), and basic operations (arithmetic, string manipulation)

Week 2: Input/Output and Conditional Statements

- Input and output operations in Python, including reading from and writing to files and console
- Conditional statements: if, else, elif, and their applications in decision-making processes

Week 3: Control Flow and While Loops

- Control flow structures: understanding the flow of program execution
- While loops: syntax, usage, and examples

Week 4: For Loops and Introduction to Functions

- For loops: syntax, range function, and applications
- Introduction to functions: defining functions, function arguments, return values

Week 5: Introduction to Modules and External Libraries

- Understanding Python modules and their role in organizing code
- Exploring built-in modules and their functionalities

Week 6: Matplotlib Module - Basic Plotting

- Introduction to Matplotlib for data visualization
- Basic plotting techniques: line plots, scatter plots, bar plots

Week 7: Lists and List Operations

- Understanding lists: creation, indexing, slicing
- List operations: appending, concatenating, length

Week 8: Dictionaries and Dictionary Operations

- Understanding dictionaries: key-value pairs, accessing and modifying elements
- Dictionary operations: keys, values, items, length

Week 9: File Handling - Reading and Writing Files

- File handling operations: reading from and writing to files
- Different file modes: read mode, write mode, append mode

Week 10: Working with Different File Formats and Introduction to Exception Handling

- Working with different file formats like CSV and JSON
- Introduction to exception handling: try, except, finally blocks

Week 11: Exception Handling - Advanced Concepts

- Handling specific exceptions: ValueError, FileNotFoundError, etc.
- Nesting try-except blocks, raising exceptions

Week 12: Introduction to Object-Oriented Programming (OOP) - Classes and Objects

- Understanding the principles of Object-Oriented Programming (OOP)
- Defining classes and creating objects

Week 13: OOP - Inheritance and Polymorphism

- Exploring concepts like inheritance, polymorphism
- Overriding methods, method resolution order (MRO)

Week 14: OOP - Encapsulation and Abstraction

- Encapsulation: access modifiers, data hiding
- Abstraction: abstract classes, abstract methods

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