Course Title: Introduction to Python Programming

Duration: 8 weeks

Course Description: This course is an introduction to Python programming for beginners. It covers the fundamental concepts and techniques of Python, providing a strong foundation for further study or professional use.

Course Objectives:

- Understand basic programming concepts and Python syntax
- Develop problem-solving skills using Python
- Write and debug Python programs
- Use Python libraries for data manipulation and visualization

Prerequisites:

- No prior programming experience required

Materials:

- Textbook: "Python Crash Course" by Eric Matthes (optional)
- Online resources: Python documentation, Stack Overflow, etc.

Assessment:

- Weekly assignments and quizzes
- Final project presentation

Week 1: Introduction to Python

Topics:

- Course overview
- Introduction to programming and Python
- Setting up the Python environment (installing Python, IDEs)

- Writing and running your first Python script

Activities:

- Lesson – Introduction to Programming and Python
- Lesson – Setting Up Python Environment
- Lesson – Writing and Running First Script

Week 2: Control Structures

Topics:

- Conditional statements (if, elif, else)
- Loops (for, while)
- Understanding indentation and code blocks

Activities:

- Lesson – Conditional Statements
- Lesson – Loops in Python
- Lesson – Indentation and Code Blocks

Week 3: Functions and Modules

Topics:

- Defining and calling functions
- Function parameters and return values
- Importing and using modules
- Writing your own modules

Activities:

- Lesson – Defining and Calling Functions
- Lesson – Function Parameters and Return Values
- Lesson – Importing and Using Modules
- Lesson – Writing Your Own Modules

Week 4: Data Structures

Topics:

- Lists, tuples, and sets
- Dictionaries

- List comprehensions
- Basic operations on data structures

Activities:

- Lesson – Lists, Tuples, and Sets
- Lesson – Dictionaries
- Lesson – List Comprehensions
- Lesson – Basic Operations on Data Structures

Week 5: File Handling

Topics:

- Reading from and writing to files
- Working with different file formats (text, CSV)
- Exception handling

Activities:

- Lesson – Reading from and Writing to Files
- Lesson – Working with Different File Formats
- Lesson – Exception Handling

Week 6: Object-Oriented Programming

Topics:

- Introduction to OOP concepts (classes, objects, inheritance)
- Defining and using classes
- Understanding attributes and methods
- Inheritance and polymorphism

Activities:

- Lesson – Introduction to Object-Oriented Programming
- Lesson – Defining and Using Classes
- Lesson – Understanding Attributes and Methods
- Lesson – Inheritance and Polymorphism

Week 7: Libraries and Frameworks

Topics:

- Introduction to popular Python libraries (e.g., NumPy, pandas, matplotlib)
- Basic data analysis and visualization
- Using Python for web development (Flask or Django overview)

Activities:

- Lesson – Introduction to Popular Python Libraries
- Lesson – Basic Data Analysis and Visualization
- Lesson – Using Python for Web Development with Flask or Django

Week 8: Review and Bonus Materials

Topics:

- Course review and Q&A
- Final project presentations
- Next steps in Python learning

Activities:

- Work on a final project that incorporates course concepts
- Present the final project to the class
- Discuss resources for further learning and professional development

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