

# **Introduction to Computer Science with Python**

## **Professor Jane Doe**

### **Course Description**

This course serves as an introduction to computer science concepts using the Python programming language. Students will learn fundamental programming concepts, problem-solving techniques, and software development skills. Emphasis will be placed on developing computational thinking and understanding the principles of computer science through hands-on programming exercises and projects.

### **Course Objectives**

- Understand basic programming concepts such as variables, data types, and control structures
- Learn how to write, test, and debug Python programs
- Explore fundamental algorithms and data structures
- Develop problem-solving skills through programming challenges
- Understand the importance of algorithmic efficiency and performance
- Gain practical experience in software development and coding practices
- Apply computer science concepts to real-world problems and projects

### **Topics Covered**

1. Introduction to Python programming language
2. Variables, data types, and basic operations
3. Control structures: conditionals and loops
4. Functions and modular programming
5. Lists, tuples, and dictionaries
6. File handling and input/output operations
7. Object-oriented programming concepts
8. Recursion and recursive algorithms
9. Searching and sorting algorithms
10. Introduction to algorithm analysis and complexity
11. Introduction to computational thinking and problem-solving strategies
12. Project: Implementation of a simple game or application using Python

### **Grading**

- Weekly programming assignments to reinforce concepts learned in class (45%)
- Quizzes and exams to assess understanding of course material (20%)
- Participation in coding labs and classroom activities (10%)
- Final project: Design and implementation of a Python program demonstrating mastery of course concepts (25%)

**Prerequisites**

- None. This course is designed for students with no prior programming experience.

**Recommended Resources**

- Textbook: "Python Programming: An Introduction to Computer Science" by John Zelle
- Online tutorials and resources for learning Python programming
- Python documentation and community forums for reference and support