

Introduction to Computer Science with Python

Professor John 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