CSTWPY (Winter 2022)

Python for Beginners

Course Outline

Instructor(s):

- therealgg13 (***course coordinator***)
  Office Hours: Zoom, times TBD
  Recordings: https://twitch.com/therealgg13

1 Course Description

Description. In this course, you will discover many concepts related to computer science: variables, conditionals, operators, functions, object-oriented programming and some advanced topics such as recursion and time complexity analysis. As this is not a proofs course, we will only examine how to justify your reasoning informally, with no proofs involved. The instructor designed this course assuming all students have no prior programming experience.

Target Audience. The course is designed for those interested in pursuing a career in programming in a couple of years. Although this is an informal course to boost your programming skills, we will follow a set of guidelines to help students prepare for university. This consists of setting strict rules around collaboration and plagiarism.

Prerequisites. Students should have a basic foundation in the **English** language. Previous coding experience is an ***asset***.

2 Course Structure/Objectives

Learning Objectives. By the end of the course, students who attend this course should be able to:

- demonstrate an understanding in the concepts related to Python.
- be able to code extremely advanced applications using approximate PEP 8 techniques.

Lesson Structure. Python has gradually gained high popularity among programmers over the years, making it the preferred language for beginners and machine language. Throughout these lessons, you will learn about the basics of Python. For consistency sake, each lesson will follow the same or very similar format, as outlined below:

1. Explanation of concepts
2. Examples to further strengthen your understanding in the concept
3. Practice exercises with solutions to ensure you understand the concept more deeply.

Delivery Method. All course material is delivered ***synchronously*** with ***recordings*** available, where needed. This means all the course concept is provided ***free*** of charge on Twitch.

A typical week. When you are taking this course, a typical week **might** consist of:

- **Sunday:** Lecture delivered ***live*** on Twitch.
- **Sunday-Monday:** Read Course notes posted
- **Monday-Thursday:** Watch lecture material and attend office hours (if needed)
- **Thursday-Saturday:** Do additional exercises, if necessary

This structure of a typical week is ***recommended*** as there are no graded components in this course.

Course Notes. Course notes will be available ***upon request***.

3 Exercises/Questions

Practice Exercises. Practice Exercises will be released before the lecture, along with the with the written lessons.

The solution will be posted on the slides after the lesson. So it is important to pre-read the lecture and do the practice exercises before the lesson.

Questions. If you have any questions, please do not hesitate to go to office hours. Instructors are here to help you, ***not*** other students.

4 Summary of this course

Course outline. The course will cover:

- Basic Concepts
  - variables
  - booleans
  - strings
  - floats and integers
  - operators
- Control Structures
  - if/else statements
  - while/for loops
- Functions
- Object Oriented Programming
- Linked lists, recursion, trees, etc ...

Week	Content Covered	Practice Exercises
1	Lesson 1 – Introduction & Variables	
2	Lesson 2 – Booleans, Strings and If/else Statements	
3	Lesson 3 – Integers, Operators and Functions	
4	Lesson 4 – Lists	
5	Lesson 5 – Dictionaries	
6	Lesson 6 – While/For Loops	
7	Lesson 7 – Object Oriented Programming	
8	Lesson 8 – Recursion	
9	Lesson 9/10 – Trees	
10	Lesson 11 –Linked List	
12	Lesson 13 – Sorting Algorithms	
13	Lesson 14 – Big-oh notation	
14	Course Review	

Notes. Week 10 Material will cover:

- Introduction to Trees
- Binary / Binary Search Trees
- nth array trees
- etc . . .

Course content subject to change.