



## Python I Summer Syllabus

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### Textbook:

[http://www.davekuhlman.org/python\\_book\\_01.pdf](http://www.davekuhlman.org/python_book_01.pdf)  
[http://www.tutorialspoint.com/python/python\\_tutorial.pdf](http://www.tutorialspoint.com/python/python_tutorial.pdf)  
<https://www.codecademy.com/learn/python>

### Material Covered

The Python I is a beginner's Python programming class. We assume that the students have no previous knowledge of Python language and any other programming languages.

The course will cover (1) the Python basics – language syntax; (2) the Python basics - data types and operators: variables, arithmetic operators, logical operators, and assignment operators; (3) the Python basic – control and loops: if-else statements, for-and-while-loops; (4) understanding important built-in data type: string and list; (5) familiar with important Python built-in functions and defining user functions (6) online browsing, reading and understanding Python docs/API; (7) basic file input/output functions available in Python such as open, close, read, write.

After successfully completing the **Python I** course, students should be able to write simple Python script to perform computational and data processing tasks including reading data from an input file, parsing data elements inside the input file, manipulating the input data elements and writing the results based on the problem statements to an output file.

### Class Structure

Except for the first day, the first hour is spent reviewing the previous day's homework, material, and quiz or exam. Over the next two hours we cover new material, with example problems solved by the students throughout. During the last 30 minutes there is a comprehensive quiz with an emphasis on that day's material and in-class problem solving exercise. On Fridays, there is only one hour of new material followed by the overview of the materials taught in the week, and then the students take an hour-long comprehensive exam. Each class will include three breaks of ten minutes each.



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### Schedule:

| Date          | Topic   | Objective  |
|---------------|---|--|
| <b>Week 1</b> |   |  |
| Monday        | Welcome, Installing Python and run your first program   | Python introduction and getting familiar with Python development environment.<br>Local environment setup; Installing Python; Running Python interactively from a terminal; Using interactive help(); Running first Python script.<br>Bonus: Using Python interactive shell as a calculator for your school homework. |
| Tuesday       | Python basics – data types 1<br>Variables, assignment, multiple assignment, numbers, Arithmetic operators (+, -, *, /, %, **, //) , assignment operators (=, +=, -=, *=, /=, %=) and comments | Introducing Python language basics - variables, variable name rules, variable value assignment, integer number and floating-point numbers. Introducing arithmetic and assignment operators. Introducing comments and what makes a good comment.  |
| Wednesday     | Python basics – data types 2<br>Strings and lists   | More data type: Strings and Lists; Introducing Python string – its value assignment, basic string changing manipulations, concatenation (combining strings). Introducing Python list data type – naming and defining list, accessing list elements.  |
| Thursday      | Python basics – data types 3<br>More string, list operations and print  | More string and list operations. String common methods (isalnum, isalpha, isdigit, isspace, upper, split...). Briefing “for” loop and list looping.  |
| Friday        | Decision making and Comparison operators (==, !=, >, <, <=, >= )  | Introducing if, if-else statements and comparison/relational   |



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|               |  | operators, if-elif...else chain and nested if/else statements. Understanding true and false values.   |
| <b>Week 2</b> |  |   |
| Monday        | Introducing loop (for loop and while loop) | Introducing while loop, for loop and nested loops; Understanding the general syntax of for loop and while loop. Using loops to process items in a list; Using loops to solve math problems; Using loops to count a letter frequency in a string.... |
| Tuesday       | More condition statements and loops        | Understanding the branch statements such as break, continue and pass; Combining condition statement, loops and branching statement. Avoiding infinite loops. More in-class practice and review practice of all learned in the past few days.        |
| Wednesday     | Introducing Functions                      | What is the functions and why using functions? Two type of functions: built-in functions and user-defined functions;  |
| Thursday      | More functions, File Input/Output          | Four types of function arguments; Concept of pass by reference vs pass by value; In-class coding practice. Introducing Python File input/output.  |
| Friday        | Final review and final quiz                | Review what we learned in the Python I class. Introducing what we will cover in the Python II course. Final quiz.   |

- Do the reading and the homework. I will go over the material in class beforehand. Programming, like mathematics, is comprehensive. You need a lot more practice, especially writing your own programs.

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### **Python I Summer Syllabus**

- Write comments for major blocks. The comments help your source code readers and help yourself when you read it in a late time.
- Avoid cut/paste source code segments from somewhere else. Writing your own code helps in remembering the language, syntax and common class methods.
- Getting yourself familiar with online Python documents and Python shell help().