



OpenCG

Course Outline



What does this course cover?

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This has various modules, composed of several in depth lessons. Below, the table illustrates what modules are in our Introduction to Programming with Python course.

Module 1: Getting Started	Module 6: Loops
Module 2: Variables	Module 7: Functions
Module 3: Strings	Module 8: Classes and Objects
Module 4: Data structures	Module 9: Modules and Packages
Module 5: Conditional Expressions	Module 10: File Input/Output

Module 1: Getting Started

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This module consists of three lessons. They are summarized below.

Lesson 1: Setup - In this lesson we'll learn how to setup our programming environment.

Lesson 2: Printing - In this lesson we'll learn how to utilize the print function to display information to the user.

Lesson 3: Comments - In this lesson we'll learn how to add comments to our code to describe what certain sections do.

Module 2: Variables

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Lesson 1: Introduction to variables - In this lesson we'll learn what variables are, and how we can create them

Lesson 2: Data Types and Conversions - In this lesson we'll learn what the various data types are and how we can convert between the various types of data

Lesson 3: Arithmetic Operators - In this lesson we'll learn what the various arithmetic operators are and how we can use them to do math in our code

Lesson 4: Variable Assignments - In this lesson we'll learn how we can assign a value to a variable and then reassign a value to that same variable

Lesson 5: Booleans - We'll learn all about booleans in this lesson

Lesson 6: Logical Operators - We'll the logic operators **and or & not**

Lesson 7: Comparison Operators - In this lesson we'll learn the various comparison operators

Module 3: Strings

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Lesson 1: Input - In this lesson, we'll learn how we can obtain information from the user

Lesson 2: Concatenation - We'll learn how to put strings together to form larger, and more complex strings

Lesson 3: The in operator - We'll learn how to use code to examine strings to find a substring (*string within a string*)

Lesson 4: String Length - We'll learn how to find the length of a string

Lesson 5: Escape Characters - In this lesson, we'll cover a few of the escape characters native to Python

Lesson 6: String Methods - We'll learn three of the main methods you can call on strings

Lesson 7: String Formatters - We'll learn about how we can use string formatters to add variable values to a string

Module 4: Data Structures

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Lesson 1: Zero Based Counting - In this lesson we'll learn how to count like programmers

Lesson 2: Introduction to Lists - We'll learn how to create lists and store data in them

Lesson 3: List Operations - We'll learn the various ways to add or append values to a list

Lesson 4: List Items - This lesson is a little more challenging. We'll learn about slices and how we can assign a value to a slice

Lesson 5: Tuples - We will talk about what tuples are and how we can create them. We'll also compare and contrast tuples to lists

Lesson 6: Dictionaries - We'll learn about keys and values, as well as how to create a dictionary

Lesson 7: The in Operator - We'll learn all about the in operator to find certain values within a list, tuple, or dictionary

Module 5: Conditional Statements

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Lesson 1: Boolean Review - We will quickly take a look back at booleans and logical operators to prepare for this module

Lesson 2: If Statements - In this lesson, we'll talk about what conditional statements are and how we can use them to make decisions

in our code. We'll also look at our first flowchart together to get a better image of how if statements work

Lesson 3: Else and Elif Statements - This part of the module will teach you about else and elif statements. These can be used to specify a default block of code to be run if a condition is not met

Module 6: Loops

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Lesson 1: What are loops? - In this part of the module we will just talk about what loops are and how you can use them

Lesson 2: For Loops with Strings - You can also use a for loop to iterate over strings, we'll learn how to do that in this lesson

Lesson 3: For Loops - This lesson will talk about the for loop

Lesson 4: While Loops - We'll learn how to loop code while a certain condition is true

Lesson 5: Break Keyword - This lesson will introduce you to infinite loops and how to use the break keyword to escape them

Module 7: Functions

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Lesson 1: What are functions? - This lesson will introduce the *concept* of functions as well as top down design and decomposition. This lesson will not contain any coding, it is entirely conceptual

Lesson 2: Defining a function - This lesson will actually teach you how to take the concepts we learned in the first lesson, and use Python to make functions

Lesson 3: Arguments (or parameters) - We'll learn how to write functions that take parameters and how we can call them and pass them arguments

Lesson 4: Return Values - This lesson will introduce return values and how we can use the return keyword to store their values into variables

Lesson 5: Default Parameters - In this lesson, we'll learn how to create a default value for a parameter

Module 8: Functions

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Lesson 1: What are classes and objects? - Classes and objects really ties in object oriented programming into this course. In this lesson, we'll learn the concepts of classes and objects

Lesson 2: Variable access - We'll learn how we can access variables in our classes

Lesson 3: Self parameter - We'll learn how we can use the self parameter to access the object being created

Lesson 4: init method - We'll learn all about the initialize function (`__init__`) and how it works

Module 9: Modules and packages

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Lesson 1: What are they? - We'll learn about external modules and packages and we'll look at various external Python libraries like Pandas, Turtle, and Tkinter

Lesson 2: Importing modules and packages - We'll learn how to write our own modules and packages and import them

Lesson 3: Python Standard Library - We'll learn about external modules and packages and we'll look at various external Python libraries like Pandas, Turtle, and Tkinter

Lesson 4: From Import - You can use the from keyword to import certain classes from a module without the need to use the module name prefix

Module 10: File I/O

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Lesson 1: Why is this important? - We'll talk about why it's good to use file input and output to save data and not lose it when the program stops executing. This is another conceptual lesson, there is no code in this lesson

Lesson 2: Reading from a file - The first thing we'll learn is how to open a file and read from it

Lesson 3: Writing to a file - Finally, we'll learn how to open the file in write mode and add data to it





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