

## Intro. To Python Curriculum

### **Overview**

This course teaches students how to code using the Python programming language. Python, a high-level language used to build websites like YouTube and Dropbox. Students will learn about variables, operators, control flow constructs, computer graphics, and object-oriented programming concepts such as classes and objects. Computation thinking is emphasized throughout the course.

It is a course that will lead into the Python Games, Python Graphics, and Python Networking class. The course is built to accommodate different levels of talent. Mostly, we will focus on the terminal output as graphics will be another course.

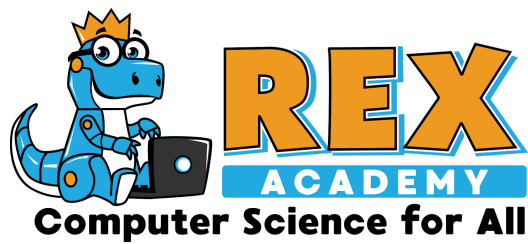
### **Layout**

Each lesson will contain the following:

- Powerpoint. Each lesson will have lots of practices for follow along with videos that will have full explanations.
- Lots of in - lesson practices. These are small little checkpoints for each new small concept.
- Labs. There will be anywhere between 5 - 10 of them depending on lessons and content of various difficulty levels. Video walk through solutions will be provided for each. More information is provided below.
- End of the lesson quiz with written solutions.

There will be 3 major projects. They require an extensive amount of work to develop. They are:

- Hangman: Done after Lesson 6, Loops
- Word Guess: Done after Lesson 8, Lists
- Blackjack: Done after the entire course.



The projects will be broken up into specific modules. Each module will be of varying difficulty. This allows for differentiation amongst students of varying skill levels

Lesson Number	Learning Targets	Contents
Lesson 1: Intro.	<ul style="list-style-type: none"> <li>● Learn key terms for programming               <ul style="list-style-type: none"> <li>○ Algorithm, compiler, IDE, etc.</li> </ul> </li> <li>● Download and install Python 2.0</li> <li>● Download and install PyCharm editor</li> <li>● Write your first program</li> <li>● Basic Input and Output</li> <li>● Intro. to variables</li> </ul>	<ul style="list-style-type: none"> <li>● Powerpoint with practices</li> <li>● Homework Labs with solutions</li> <li>● Quiz with solution</li> </ul>
Lesson 2: Mathematical operations	<ul style="list-style-type: none"> <li>● Implementing math concepts, math functions, and order of operations</li> <li>● Use the different math library tools</li> </ul>	<ul style="list-style-type: none"> <li>● Powerpoint with practices</li> <li>● Homework Labs with solutions</li> <li>● Quiz with solution</li> </ul>
Lesson 3: Strings	<ul style="list-style-type: none"> <li>● Proper declaration of Strings</li> <li>● Using different String functions to change Strings</li> <li>● Concatenation and other special operations.</li> </ul>	<ul style="list-style-type: none"> <li>● Powerpoint with practices</li> <li>● Homework Labs with solutions</li> <li>● Quiz with solution</li> </ul>
Lesson 4: Booleans and Branching	<ul style="list-style-type: none"> <li>● Foundations of logic.</li> <li>● AND and OR statements.</li> <li>● Doing conditional statements</li> <li>● If statement</li> <li>● Else If statement</li> <li>● Else statement</li> </ul>	<ul style="list-style-type: none"> <li>● Powerpoint with practices</li> <li>● Homework Labs with solutions</li> <li>● Quiz with solution</li> </ul>
Lesson 5: Loops	<ul style="list-style-type: none"> <li>● Learn the structure of the 'for' loop</li> <li>● Learn the structure of the 'while' loop               <ul style="list-style-type: none"> <li>○ Learn the timers of Python</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Powerpoint with practices</li> </ul>

		<ul style="list-style-type: none"> <li>• Homework Labs with solutions</li> <li>• Quiz with solution</li> </ul>
<b>Lesson 6: Project Hangman</b>		
Lesson 7: Sets, lists, and tuples	<ul style="list-style-type: none"> <li>• How to properly use the List data structure</li> <li>• How to create, edit, and change the list structure in Python.</li> <li>• Different uses for the list and set structures.</li> </ul>	<ul style="list-style-type: none"> <li>• Powerpoint with practices</li> <li>• Homework Labs with solutions</li> <li>• Quiz with solution</li> </ul>
Lesson 8: Dictionaries	<ul style="list-style-type: none"> <li>• Learn the basics of the dictionary structure</li> <li>• Applications of the dictionary structure.</li> </ul>	<ul style="list-style-type: none"> <li>• Powerpoint with practices</li> <li>• Homework Labs with solutions</li> <li>• Quiz with solution</li> </ul>
<b>Lesson 9: Project 2 - Memory Test</b>		
Lesson 10: Functions	<ul style="list-style-type: none"> <li>• Writing basic functions</li> <li>• Passing parameters to functions</li> <li>• Applications of the dictionary structure.</li> </ul>	<ul style="list-style-type: none"> <li>• Powerpoint with practices</li> <li>• Homework Labs with solutions</li> <li>• Quiz with solution</li> </ul>
Lesson 11: Classes	<ul style="list-style-type: none"> <li>• Learn the important aspects of object oriented design</li> <li>• Learn the different uses for objects and their overall structure.</li> </ul>	<ul style="list-style-type: none"> <li>• Powerpoint with practices</li> <li>• Homework Labs with solutions</li> <li>• Quiz with solution</li> </ul>
<b>Lesson 12: Project 3: Blackjack</b>		