# **The Syllabus**

## **Beginner (Python) Class**

Build:

1. 2-Player Rock Paper Scissors game
2. Contact Book application
3. Quiz Game
4. Birthday Tracker
5. BMI/TDEE Calculator

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| Week | Topic | Detail |
| 1. | Course overview, Setup and Hello World | 1. Introduction  * What is programming? * What is Python? * Why Python? * Various Python versions  1. Install Python 2. Install code editor 3. The command line basics   End of Class Exercise:   * use cmd to create a folder, navigate, etc * Run Hello World |
| 2. | Git Basics | 1. Introduction    * Why learn this 2. Concept overview 3. Commands Overview 4. Markdown Basics   End of Class Exercise:   * use cmd to create a folder, navigate, etc * ***git clone*** the course repo * run *countdown.py* |
| 3. | Variables, Data Types and Arithmetic. Arrays and Lists. | 1. Introduction 2. Data types and Casting 3. Arithmetic & String Concatenation 4. Arrays and Lists 5. Comments   Problem to Solve:   * Calculate Area of Triangle * Calculate Volume of Cone   End of Class Exercise:   * Calculate Squares * Calculate Area of Rectangle   Take Home Challenge:   * Calculate volume of rectangular block * Calculate area of Circle * Calculate volume of Sphere |
| 4. | Conditional Statements | 1. Discuss THC 2. Introduction 3. Understanding the Truth Table 4. Conditional operators, and if statements 5. Input and Output   Problem to Solve:   * Calculate BMI   End of Class Exercise:   * Write if statement   Take Home Challenge:   * Number guessing game * Calculate Area of Triangle or Rectangle |
| 5. | Loops | 1. Discuss THC 2. Introduction 3. Arrays and Lists Revisit (indexing) 4. For loops, while loops   Problem to Solve (PTS):   * Countdown program * Print Even Numbers * Enhancement to calculate BMI   End of Class Exercise:   * Multiples of 3 loop * Odd numbers only   Take Home Challenge:   * Fibonacci sequence * Palindrome Checker |
| 6. | Functions and Recursion | 1. Discuss THC 2. Introduction 3. Functions 4. Recursions 5. Refactor   Problem to Solve:   * Is even * Area of rectangle * Factorial * BMI Calculator (refactor) * Number guessing game (refactor)   End of Class Exercise:   * Is Odd * StringConcatenator (e.g., getFullName)   Take Home Challenge:   * Use functions to calculate volume of 10 spheres of various radii * Convert Fibonacci sequence into function that takes 1 argument of how many numbers to show |
| 7. | Classes, objects and dictionaries | 1. Discuss THC 2. Introduction 3. Classes 4. Objects 5. Dictionaries 6. Imports and JSON/TXT parsing   Problem to Solve:   * ContactBook Application * Needs menu   End of Class Exercise:   * Employee Class   + Name   + Id   + Position * Store employees in list * Display all employees   Take Home Challenge:   * PatientsBook Application * Store in JSON * Word Counter from TXT file |
| 8. | Course Project: Quiz Game | 1. Introduction 2. Setup Git 3. Get a list of question-answer dictionary   Problem to Solve:   * The Quiz Game   End of Class Exercise:  Pick your own project:   * Birthday Tracker – birthdates are saved as JSON * 2- player Rock-Papers-Scissors game * Inventory System: can insert new item, search by name, display all, update item, must have menu, and able to save changes * Tic Tac Toe * Quiz Game with Score Board   Take Home Challenge:   * Project |
| 9. | Course Project:  Quiz Game | 1. Q & A   Problem to Solve:   * Quiz Game (continued) * Calculate score * Give grading according to score range   End of Class Exercise:   * Project   Take Home Challenge:   * Project |
| 10. | Course Completion | 1. Project completion 2. Q&A 3. Feedback with Google Form 4. Recap 5. Suggested Projects 6. Advertise Intermediate Course 7. Self-study topics    * Error Handling 8. Other websites for reference |