COMPUTER SCIENCE 40S (SECOND COURSE)

Mr. Trotter

Room 111

1. INTRODUCTION:

   In this second computer science course students will learn how to develop games and apps in Python. The course will build on the concepts learned in Computer Science 30/40S and introduce concepts used to build games, such as classes, methods, animation, and array-backed grids. Basic programming concepts learned last year will be integrated with elements of game design, including designing a game template, using animation and sound, and controlling action with a mouse, the keyboard, or joysticks. Source: Program Arcade Games With Python and Pygame (http://programarcadegames.com/index.php?chapter=python_as_calculator&lang=en)

2. LEARNING OUTCOMES:

   A. Review of Basic Programming Concepts:
      - Variables, Constants, and data types
      - Boolean logic and If statements
      - Random numbers
      - Looping- While and For loops
      - Functions and variable scope
      - Lists
      - Introduction to Classes and Object-oriented programming
      - Array-backed grids
      - Recursion

   B. Game Development With Pygame:
      - Write a programme for a game board
      - Introduction to pygame graphics

- Introduction to animation
- Using controllers (keyboard, mouse, and joysticks) with graphics and animation
- Importing bit-mapped graphics and sound files
- Introduction to sprites
- More complex games (sources: https://inventwithpython.com/makinggames.pdf and www.raywenderlich.com/2795-beginning-game-programming-for-teens-with-python)

C. APP DEVELOPMENT (OPTIONAL):

- Development of IOS and Android multi-touch apps in Python using an app called Kivy.
- Kivy is a cross-platform (meaning it can be used with a variety of operating systems) library developed for Python.
- Source: https://kivy.org/#home

3. ASSESSMENT:

Performance-based assessment will be used for determining grades in this course. Performance-based assessment measures the student's ability to apply concepts learned in class to complete problems. Therefore, a significant portion of your mark will be based on programming assignments, larger individual and group projects, and to a lesser extent on quizzes. Assessment will be based on these categories:

Assignments, Projects, and Quizzes:	80 %
Final Project:	20%

The Final Project will consist of either a game or app that you develop in collaboration with another student. The game or app can not be exactly the same as one you submitted as an assignment.

4. CLASS RULES AND EXPECTATIONS

- You are expected to complete all assignments to the best of your ability.
- You will work independently without interfering with the academic progress of other students.
- You are responsible for making sure that all assignments are handed in to the proper location.
- There will be frequent instances where you will be expected to collaborate with other students. It is imperative that you cooperate with others and fulfill any obligations assigned to you by your group/partner.
- You need to make a folder for Computer Science in your directory and load all completed assignments in it. Name the folder: firstname.lastname.compsci40

5. WHAT YOU NEED FOR CLASS

- You will need earphones/headphones every class
- You can load Python 3.6.5 on all of your devices. For computers, it is a free download that you can get at python.org. There are Python apps for cellphones and tablets as well.
- I will provide you with a list of resources you can use throughout the course. Python is a very useful and popular language so there is no shortage of resources for it.