Curriculum Breakdown

Course Objectives:

This is an introductory video game design course intended to introduce you to the basics of computer programming using the Python and Pygame coding libraries. The goals and expectations of this 10 day course are to design two basic computer games using the Python computer language. We will cover the use of computer programs to display images on the screen, handle user input and much more. At the end of this course all participants will leave with an understanding of how to use basic coding skills to implement and automate programs/functions to create an interactive Python program.

Course Keywords:

PYTHON	COMPUTER PROGRAMMING LANGUAGE	MODULE	DOT NOTATION	IDE- Integrated Development Environment
PARAMETER/ VARIABLE/ OBJECT	CLASS	INSTANCE	CONSTRUCTOR	
PYGAME	.CMD SHELL	VIDEO GAME		GAME LOOP/STATE

Week 1

OBJECTIVE: Introduce basic concepts of Python programming for game development using PyGame. Complete Snake game using introductory concepts.

Day 1:

Objective - Video Game Programming basics with Python/PyGame

Notes

VSCODE Wrap Text Shortcut = Alt+Z or View>>Wrap Text

SHIFT + ALT + DownKEY will copy selected code right below selection

CTRL + / to Comment a selection even over multiple lines

1. Introduction and Greetings
2. Computer Assignments - Sign into emails
3. What is a video game and how do they work? General game demo and introduction. (Students will have the opportunity to play Pygames.) Choose game and play while talking.
    a. Video game definition and Python examples DOWNLOAD AND RECORD PYGAME EXAMPLES FROM COMPUTER
    b. Play examples from class computer SET UP LAPTOP ON LARGE SCREEN BESIDE TEACHERS DESK
4. What is Python development? (Introduction to the IDE and keywords)

    a. Definition and use cases while presenting local game play recording from Snake game and other examples Refer to Teachers Notes Doc and Definitions
5. Introduction to command line
    a. Run python command to check for proper installment
    b. Python -m pip install -U pygame --user
6. Introduction to Pygame
    a. Use Command Prompt/pip to download Pygame
        i. python -m pip install -U pygame --user
    b. Use pip to check download
        i. python -m pygame.examples.aliens
7. VsCode Intro
    a. Use Command code . to open Vscode Application
    b. What is an IDE
8. Screen Dot Demo
    a. Present the screen demo and expected functionality using the command line to prompt screen
    b. Show Screen demo python module code
    c. Code Walkthrough
    d. Intro to customizing colors
    e. Customize location
    f. Customize Shape
    g. BONUS how to get the dot to move with KEYS
9. Display code and game side by side for mental reference and choose functions for interactive function game.
    a. Choose functions and explain the use case within the program
    b. Break students into groups of 3
    c. Allow them the opportunity to organize themselves
    d. Give each group 5 mins to present themselves and explain to the class what their function does within the program
10. Break to play the game once again for five minutes before moving end of day

Day 2:
Objective - Game Loop and Snake Game setup(Design screen and main game loop)
KEYWORDS: DOT NOTATION, PARAMETER

1. Introduction and Day 2 Objective
2. Snake Game Demo and Play on class computer
3. Pygame imports and Initialization Code Walkthrough
4. What is a GAME LOOP?
   https://gameprogrammingpatterns.com/images/game-loop-simple.png
   https://www.gamedesigning.org/wp-content/uploads/2020/08/Core-Game-Loop.jpg
5. What is Game State?
   https://m.media-amazon.com/images/G/01/DeveloperBlogs/AppstoreBlogs/default/102117_StateMachine._CB513660882_.png?t=true

6. Today we are going to work on the first step in the game state of our Snake Game which is the intro screen and set the score to zero using built in Pygame display function
7. Creating the screen and variables for the display function
8. Code Walkthrough
    a. Imports and initialization
    b. Set up the overall game - create all the parts for the game and setting future class code blocks to pass
    c. Set up Variables Library section with comments
        i. Set WIDTH and HEIGHT
    d. Define Game Loop and surface features by calling on the width and height variables with def main():
    e. Defining the game loop… while/true
        i. Check code for def drawGrid(surface)
        ii. What is a conditional statement? Brief intro to for/while loops
        Image Example 1
        Video
        Iteration is the repetition of a process in order to generate a sequence of outcomes. Each repetition of the process is a single iteration, and the outcome of each iteration is then the starting point of the next iteration.
        iii. Clock

Day 3:
Objective - Snake and Food Code Walkthrough

1. Intro / Objective recap DONE

2. Error handling intro // Screen test recap
    a. *errorSupport-problems.py found in Desktop\Pygame\Week 1 Code Folder

3. Videos or sumn

4. What is DATA TYPE?
    a. Data Types are a way to categorize information or data. Each data type has a specific set of rules it has to follow. Specifying data types ensures the computer understands what needs to be done to successfully run your program.
    b. Floats: FLOAT data type stores double-precision floating-point numbers with up to 17 significant digits. 450 is 450.00. The .00 are floating numbers following the decimal.
5. drawGrid()
    a. Code walk through to define the checkerboard for the snake screen
        i. What is a conditional statement? Brief intro to for/while loops
        In Python, condition keywords act depending on whether a given condition is true or false. You can execute different blocks of codes depending on the outcome of a condition.In Python, condition keywords

act depending on whether a given condition is true or false. You can execute different blocks of codes depending on the outcome of a condition.

Image Example 1
Image w indentation and range
Video
Iteration is the repetition of a process in order to generate a sequence of outcomes. Each repetition of the process is a single iteration, and the outcome of each iteration is then the starting point of the next iteration.

6. Return to game loop in while true: add the following code before the pygame.display function
    a. screen.blit(surface, (0, 0))

7. Enter the shell and test run program by calling python and the name of your program

Day 4:
Objective - Game Mechanics

1. Intro and CheckerBoard recap
    a. Have Bree record students // record teacher screen

2. Def Snake() and Food()
    a. What is a class (Snake and Food)
    b. A CLASS is a code template for creating objects. ** Class is a blueprint or code template for object creation. Using a class, you can create as many objects as you want.
    c. Init, length, direction >> Move into variables library before playing the video
    d. What are Game Mechanics?
        i. Breaking Down Video Game Mechanics as it relates to Game state Play till 1 minute mark.
        ii.
    e. Defining the startup self state >> @ self.directions We need to go back into the variables library to define the UP DOWN LEFT RIGHT functionality
        i. The direction variables are expressed by two numbers that represent a change in the (x,y) coordinates. UP and Down are marked by a change in the x coordinate and LEFT, RIGHT are marked by a change in the y coordinates

    f. While we're still in the variables library, let's go ahead and choose the colors for the snake.
        i. Google: COLOR PICKER

3. Snake() >> Get head position of snake
4.
5. Play Completed Games on Laptops 5 mins
6. Class Group Discussion
    a. What works/ needs adjusting? NEED ADJUSTMENT CODE OPTIONS AND CODE FILES FOR REFERENCE
    b. What kind of changes would we like to make?
        i. Background Color
        ii. Snake color
        iii. Snake border color and width
        iv. Speed
7. Code Walkthroughs for adjustment

Day 5

Recap
Game mechanics over view
Event handler demo
Code walk through to finish

Choose colors for food and border

Snake and food class

Add functionality to the game loop