Murrieta Valley Unified School District **Updated: October 2019**
High School Course Outline

Course Title: Computer Programming and Game Design (aka Video Gaming I)

Department: Practical Arts

Course Number: 7553

Grade Level(s): 10-12

Industry Sector: Art, Media and Entertainment/Information Technology

Career Pathway: Media and Design Arts

UC/CSU (A-G) Req: F

Brief Course Description: This course introduces students to video game design and creation through computer hardware and software. Fundamentals of computer programming will be introduced that allows students to write and design computer programs for video games. The video games are developed to solve common every-day problems, including business and gaming theory. The software emphasis is structured programming using a combination of any of the BASIC programming language, Alice 2.0, and its derivatives. Students will have a "hands on" opportunity to use other computer application programs such as word processing, web page design, audio editing and development, presentation software and animation software.

I Goals and Objectives:

A. The student will recognize the potential of a career in information technology.

B. The student will develop a timeline describing the development of hardware, software, networking and the Internet.

C. The student will use multiple numbering systems with basic skills to describe the difference between binary and decimal numerals and convert between the numbering systems. The proficient skills, the student will complete arithmetic operations in binary and describe the difference between octal and hex numbering systems.

D. The student will incorporate algorithms into programs to solve problems.

E. The student will effectively apply the structured programming process to real type-problem solving by defining the problem and create a structure chart and flow chart to solve the problem.

F. The student will be given support to design and implement an algorithmic solution consistent with the structure and flow chart.

G. The student will compare and contrast various computer languages.

H. The student will be able to identify the logical operators in Basic programming language:
   1. Be able create with Basic code an object and manipulate that object in a game program.
   2. Be able to color and/or texture an object in a game program.
   3. Be able to load a pre-made model into a game.

I. The student will able to understand the concept of object collision and be able to write programming code that will manipulate object collision within the game engine.
   1. Determine which type of file is usable as a texture in Dark Basic code.
   2. Determine which type of file is usable as sound or music within the game engine.
   3. Be able to write Dark Basic code that will play and set the volume for a sound or music within the game engine.

II Areas of Study for Video Gaming Concepts:

A. Introduction to Gaming
B. Storyboards
C. Virtual Internship Game Design Program Simulation 1
   1. Internship reports - Training Log – Certification
D. DDR simulation Dance Dance Revolution
E. Basic programming Introduction to BASIC
F. Alice 2.o/Alice2.2 basic programming:

Outline of Content for Major Areas of Study

A. Introduction to Video Gaming Basics
   1. Industry
   2. History
   3. Consoles/Arcades

B. Game Elements/Interface Design
   1. Basic Software-Engineering Principles
   2. Game hardware/Hardware basics

C. Alice2.0 Programming:
   1. Programming preparation and documentation procedures
   2. Game story/Storyboards/Characters
   3. Application of Logical Systems
   4. Basic coding applications

D. Alice Concepts:
   1. Simple commands and structures
   2. Basic Programming
   3. Object Oriented and Event Driven Programming:
   4. Methods and Parameters
   5. Interactive programming –
   6. Looping-Branching
   7. Flowcharts
   8. Algorithms

9. Boolean Logic
10. Event and object handling methods

E. Project I - Simulation – Simulation - Carbonate –
Learn how to and build a 3D video game to help launch a new healthy soft drink with four different Certifications students

1. Phase 1
    a. Identify Problem
    b. Introduction to the company and internship and documentation

2. Phase 2
    a. Introduction to dark basic
    b. Load gaming/animation
    c. Introduction to Dark Basic Introduction to Arrays
        (i) Load and Run a Program Two-Dimensional Arrays
        (ii) Remark Statements Data Types and Arrays
        (iii) Program Structure
        (iv) Creating Objects with Arrays
        (v) Editing Program Code
    d. Equations in Code Sprites and HUDs
        (i) Generating Random Numbers Sprites and Textures
        (ii) Using Randomly Generated Numbers Sprites and Variables
        (iii) Variables and Random Numbers HUD Tracking Map
        (iv) Inserting a FOR/NEXT Loop Cut-scenes
        (v) FOR/NEXT Loops in a Game Advanced Camera
        (vi) IF/THEN Loops in a Game Culling
        (vii) Inserting IF/THEN Loops Basic Collision
    e. Introduction to Functions
        (i) Changing the Cube's Size Using Arrays in Functions
        (ii) Print and Text Using the CLI Functions and Objects
        (iii) Using a Background Set Object Command
    f. Do Loops Depth
        (i) Print Statement Trick and Debugging Motion with Multiple Stills
        (ii) Problem with the Program
    g. Motion with Scroll and Scale
        (i) Variables
        (ii) Heads-Up
        (iii) Displays

3. Phase 3
    a. Research of the market
    b. Design the character
    c. Camera views
    d. Cameras in a Game
    e. Objects:
        (i) Introduction to Static and Collision
        (ii) Animated Objects Sliding Collision
        (iii) Multiple Objects Camera Static Collision

4. Phase 4
    a. Brainstorming
    b. Interface player
    c. Projectiles
        (i) Input from
        (ii) Humans Ambient Light
        (iii) Collisions Point Light
        (iv) Textures Directional Light
    d. Texture Examples in Game Code Fog
    e. Sounds in Game Code Levels

5. Phase 5
    a. Making a Final EXE

6. Phase 6
    a. Test and evaluate
    b. Bugs/quality
    c. Presentation story

7. Phase 7
    a. Prototype
    b. Oral Presentation

II Accountability Determinants

A. Teacher observations of day-to-day classroom participation, effort, behavior and achievement
B. Competition for four Certification for each internship simulation Carbonate
C. Individual performance tests, student internship log, software activities and daily work assignment
D. Student will produce and create actual video games and people model
E. Create Student Portfolio

III Instructional Materials and Methodologies

A. Required Text and Software
    1. Video Game Design Level 1 software- Isupportlearning!
    2. Dark Basic software
    3. Alice2.0/2.2 software
    4. Alice 2.0 Introductory Concept and Techniques – Shelly Cashman Series ISBN : 1-4188-5934-6
    5. Learning to Program with Alice. ISBN: 0-13-187289-3

B. Supplementary Materials
    1. Video Game Controller
    2. Headphones
    3. Other Software Utilized:
        a. Adobe Photoshop/Illustrator
        b. Macromedia Flash/Fireworks
        c. Dark Basic Sound, Text, Motion software