Catholic Memorial HIGH SCHOOL

Year Long Course Plan

Department: Computer Science **Course: Programming in 3-D Animation 482**

Essential Learning Outcomes: After successfully completing this course, students will be able to:

1. Select a 3-D world, select 3-D objects for the world in Alice and manipulate the objects
2. Not using the computer, demonstrate logical problem solving strategies, solve a problem by creating an algorithm, a storyboard
3. Create 3-D programs with animation in Alice based on storyboards they have created
4. Using Alice, creating programs that use methods, functions, decision control, and loop structures to animate objects.
5. Using Audacity, to modify music and convert it into the appropriate file to incorporate it into Alice
6. Use Nyquist to program their own music and incorporate it into Alice
7. Demonstrate an understanding of the basic concepts of object-oriented programming using the Alice interface and animating the objects.
8. Create events in Alice that manipulate objects in three-dimensional space and the Alice camera showing viewers those objects
9. Use text, graphic images and sound as objects in Alice programs
10. Use the array structure to animate a group of objects in Alice
11. Demonstrate knowledge of the fundamental concepts of programming and problem solving
12. Create simple applets in Java

Quarter 1	*Quarter 2*
Unit 1: Introduction to Alice (ELO 2) • Overview of Alice • Alice Concepts • Programming instructions – drag/drop • Objects and 3D models • Three dimensions and six directions • Objects center, distance, position • animation • Start Alice – view sample worlds • Alice tutorial • Special effects • ASSESSMENT: Written quiz, written test, create animation projects **Unit 2: Animation programs: scenarios and storyboards (ELO 1, 2, 3, 4, 11)** • Scenarios • Designing visual storyboards • Textual storyboards • Create animation • Translate storyboard to program code • Fix bugs • Comments	**Unit 7: Repetition (ELO 1, 2, 3, 4, 8, 9,11)** • Counted loop • Nested loop • Indefinite while loop, random motion • Events and repetition • ASSESSMENT: Written quiz, written test, create animation projects **Unit 8: Repetition: Recursion (ELO 1, 2, 3, 4, 8, 9, 11)** • Recursion • Random selection • Determining the winner • Comparisons with while • Towers of Hanoi puzzle • Camera and animation controls • ASSESSMENT: Written quiz, written test, create animation projects **Unit 9: Lists and list processing(ELO 1, 2, 3, 4, 8, 9, 10,**

- Orientation and movement
- Vehicle property
- Turn to face and point at methods
- Move to and move toward methods
- ASSESSMENT: Written Test, written quizzes, create animation projects

Unit 3: Programming: Putting together the pieces (ELO 1, 2, 3, 4, 11)

- Built-in functions to move objects
- Using expressions
- Conditional execution
- Relational operators
- Repetition – do in order vs. do together
- Texture maps
- Special effects, ex. Fog
- ASSESSMENT: Written Test, written quizzes, create animation projects

Unit 4: Classes, objects, methods and parameters (ELO 1, 2, 3, 4, 5, 8, 9, 11)

- Classes, Objects, Methods
- World-level methods
- Importing sounds
- Using Audacity to manipulate sound
- Creating and calling methods
- Parameters
- From Storyboards to animation
- Object parameter
- Class-level methods
- Creating a new class
- Visible and invisible objects
- Rotating around invisible object
- ASSESSMENT: Written quiz, written test, create animation projects

Unit 5: Interaction (ELO 1, 2, 3, 4, 8, 9, 10)

- Interactive programming
- Events
- Keyboard-control
- Mouse-control
- Input
- Respond to events
- Parameters and event handling
- Special effects
- Tips and techniques for events
- ASSESSMENT: Written quiz, written test, create animation projects

Unit 6: Functions and if/else (ELO 1, 2, 3, 4, 5, 8, 9, 10)

- Built-in functions
- Create functions
- Return statement
- If/else avoid collision

11)

- Example of list and animation – coaches dance
- Creating a list
- Animating list – for all "dancers" in order
- For all together
- Array visualization
- Array with random access
- Tips and techniques - poses
- ASSESSMENT: Written quiz, written test, create animation projects

Unit 10: Java and applets(EOL 12)

- Applet
- Creating applet
- Running applet
- Assessment: create applets

• Random numbers and random actions • Random motion • ASSESSMENT: Written quiz, written test, create animation projects	