Syllabus for Unity Game Development Club

Objectives : Students will be able to :

- Understand and use the Unity Editor and its components.
- Write basic C# scripts to control game logic and behavior.
- Create UI with text, images, buttons, sliders, ect.
- Make 2D and 3D games with sprites, models, cameras, lights, ect.
- Apply physics and collisions to their game objects.
- Animate their characters and objects with keyframes and curves.
- Add sound effects and music to their games.
- Build and deploy their games to different platforms.

Prerequisites : No prior experience with Unity or C# is required. However, some basic knowledge of programming concepts such as variables, functions, loops, and conditions would be helpful. A computer that can run Unity with a stable internet connection is also required.

Club Materials : Students will need to install the instructed version of Unity. Students will also need a code editor such as Visual Studio or Visual Studio Code. Free assets could be found in the Unity Asset Store or other online sources.

1. Introduction to the Environment

- Learn how to install Unity
- Explore the Unity Editor and its Windows
- Create their first Unity projects and Scenes
- Learn how to use the Hierarchy, Inspector, Project, Console, and Game Windows
- Learn how to create and manipulate game objects and components
- Learn how to Save and Load Scenes

2. Unity

- Learn how to use the Scene View and Game View
- Learn how to use the Transform tool, Rotate tool, Scale tool, and the Rect tool
- Learn how to use prefabs and instantiate them in their scenes
- Learn how to use cameras and camera settings
- Learn how to use lights and lighting settings

3. Introduction to the Game Engine

- Learn how to use the play mode and pause mode
- Learn how to use the time settings and the time class
- Learn how to use the input settings and the input class
- Learn how to use the physics settings and the physics class
- Learn how to use the quality settings and quality class
- Learn how to use the graphics settings and the graphics class

4. Unity and the different platforms

- Learn how to use the build settings and the player settings
- Learn how to build their games for different platforms such as Windows, Mac, Linx, Android, iOS, etc.
- Learn how to test their games on different devices or simulators
- Learn how to optimize their games for performance and compatibility
- Learn how to troubleshoot common errors and issues

5. Scripting

- Learn how to create C# scripts in Unity
- Learn how to attach scripts to game objects or components
- Learn how to use variables, constants, data types, operators, expressions, ect
- Learn how to use functions, parameters, return values, scope, ect
- Learn how to use classes, objects, constructors, inheritance, polymorphism, ect
- Learn how to use interfaces, abstract classes

6. Unity in action

- Learn how to use events such as Awake(), Start(), Update(), FixedUpdate(), LateUpdate(), ect
- Learn how to use coroutines for asynchronous tasks
- Learn how to use delegates, events, actions, lambdas, ect. for callbacks
- Learn how to use collections such as arrays, lists, dictionaries, ect. for storing data

7. Final Project

- Apply what you have learned so far to create a simple game of your choice
- Follow the steps of game development such as planning, designing, prototyping, testing, debugging, ect.
- Use the Unity UI system to create menus, buttons, text, ect.
- Use the Unity animation system to create animations for their characters and objects
- Use the Unity audio system to add sound effects and music to their games
- Add some polish and flair to your game with particles, shaders, post-processing, ect.

Evaluation : The club will not have any formal exams or grades. However, students will be expected to complete small assignments and a **Final Project**. The assignments will be based on the topics covered in each session and will require students to apply what they have learned. The **Final Project** will be based on the students' own game ideas and will require students to create a playable prototype of their game. The students will showcase their game to the rest of the school at the end of the semester. Hopefully, this showcase will peak other students' interests in game development as well.

Expectations : The club expects students to follow these rules and guidelines :

- **Be Respectful** of each other's ideas, opinions, work, and feedback.
- **Be Responsible** for your own learning progress.
- **Be Cooperative** and **Collaborative** with your teammates and peers.
- **Be Creative** and **Curious** about game design and development.
- **Be Passionate** and **Enthusiastic about making games.**