

## **JCAT Game Engine Proposal**

**Description:** JCAT Game engine is a project where we build a game engine from scratch using Vulkan and C/C++. We started this project because we wanted to learn how low level graphics programming works and wanted to learn the process of how a game is created from the primitive level. The goal by the end of this semester is to have a functional game engine that we could use to develop a game with. We also want to be able to have a deep understanding of how the game engine works.

### **Communication:**

Communication channel - <https://discord.gg/9pEQCpx>

GitHub - <https://github.com/JCAT-Games/JCAT-Game-Engine>

### **Techstack:**

C/C++

Vulkan

GLFW

Glm

glslc

Blender

CMake

Make

### **Goals**

1. Develop a deep understanding of low-level graphics programming
2. Gain a comprehensive understanding of the functionality and architecture of a game engine.
3. Learn and apply C++, C, and Vulkan to design and develop a game engine.
4. Design and implement a game engine that facilitates the development of games in the foreseeable future.
5. Develop the capability to integrate and utilize 3D models within our game engine.
6. Integrate and implement shaders within our game engine to enhance visual rendering.
7. Implement a physics engine to simulate realistic physical interactions within our game engine.
8. Implement particle systems and visual effects to enhance the realism and visual dynamics of the game engine.

### **Milestones**

#### Milestones for September:

- Start our GitHub repository
- Get all members development set up
- Learn the basics of Vulkan and graphics programming

#### Milestone for October:

- Begin working on the game engine
- Create classes for our graphics pipeline
- Configure CMake and Make instructions to build on different machines

Milestone for November:

- Start developing to load models, objects, images, etc.
- Start developing code for physics engine and simulation (Maybe)
- Look into implementing animation systems
- Start developing a layer to build games from the engine

Milestone for December:

- Finalize the game engine
- Have a deep understanding of how the game engine works and its processes

**Current Team Members:**

Christian Marinkovich - [marinc9@rpi.edu](mailto:marinc9@rpi.edu) - 4 credits - Team Lead