# Computer Graphics Coursework – Self Assessment Document

**Name:** *Arjun Khela* **ID number:** *23648079*

Complete the self-assessment grid below by writing a short explanation of how you have satisfied the requirement and how it has implemented in your code.

|  |  |  |
| --- | --- | --- |
| **Learning outcome** | **Mark** | **Weighted mark** |
| 1. Use appropriate mathematical tools (40%) | 58 | 0.40 \* 58 =23.2 |
| 2. Develop a 3D graphics application (30%) | 58 | 0.40 \* 58 =17.4 |
| 3. Write shader code (30%) | 48 | 0.3 \* 48 = 13.4 |
|  | Total | 55 |

Your mark for each Learning Outcome (LO) is the highest mark achieved based on the criteria specified in the self-assessment grid. Note that you will need to have satisfied all criteria at the lower mark bands to be awarded marks in the higher mark bands, e.g., to get a mark in the 70 - 80 band for a learning outcome you will have needed to have satisfied all criteria in the 40 – 50 and 50 – 60 mark bands.

## Learning Outcomes:

**LO1** Select and use appropriate mathematical tools for constructing and manipulating geometry in 3D space.

**LO2** Develop an interactive 3D graphics application using an industry-standard API.

**LO3** Write shader code for the programmable pipeline on modern graphics hardware using an industry standard shader language.

## Self-assessment Grid

|  |  |  |
| --- | --- | --- |
| **Mark** | **Criterion** | **Comments (state how and where you have achieved the criterion)** |
| 42, 45, 48 | LO1: Basic use of vector and matrix objects | I used the vectors glm: vec3 and vec 2 and matrix mat 4 types through the assignment to define the object position and transformations. |
| LO2: Application compiles and runs without alterations to the source code of CMake file. | Paste a screenshot of your application below |
| LO3: Implementation of shaders to apply appropriate textures to objects. | I implemented shaders using GLSL to apply textures to my 3D models. The The vertexShader.glsl passes UV coordinates to the fragmentShader.gls which then display textures, this method is shown in lab 3 as texture mapping. |
| 52, 55, 58 | LO1: Basic use of translation, rotation and scaling transformations. | Used the math class to apply translate, rotate and scale functions, these combined to animate the 3D object by rotating it. |
| LO1: Implementation of glm library functions for calculating view and projection matrices. | The use of the look at function to create a new matrix that famulated a fixed camera looking at a fixed point being the object. |
| LO2: 3D virtual world has been created using instances of a single object type. | I loaded and displayed one 3D model and applied a transformation to animate it creating a basic virtual world using a singular object. |
| LO3: Use of shaders to apply dynamic lighting from point light sources | I have not attempted this part yet. |
| 62, 65, 68 | LO1: Implementation of students own functions for calculating view and projection matrices. | I have not attempted this part yet. |
| LO2: 3D world created using multiple object types. | I have not attempted this part yet. |
| LO2: Users can navigate the virtual world using keyboard and mouse inputs. | I have not attempted this part yet. |
| LO3: Use of shaders to apply dynamic lighting from different types of light sources. | I have not attempted this part yet. |
| 72 75, 78 | LO1: Implementation of students own functions to replace glm functions (e.g., glm::length(), glm::dot(), glm::cross() etc.). | I have not attempted this part yet. |
| LO1: Implementation of quaternions to calculate rotation matrix. | I have not attempted this part yet. |
| LO2: Interactive dynamic aspects of the virtual word and controllable by the user (e.g., position of objects, location and function of light sources etc.). | I have not attempted this part yet. |
| LO3: Appropriate implementation of normal and specular maps. | I have not attempted this part yet. |
| 85, 90, 100 | LO1: Use of quaternions to calculate view matrix. | I have not attempted this part yet. |
| LO1: Use of SLERP to smooth out changes in camera direction. | I have not attempted this part yet. |
| LO2: Implementation of a third person camera with the ability to switch between first and third period view. | I have not attempted this part yet. |
| LO2: The position of the camera or character obeys the constraints of the physical space (e.g., can’t pass through objects, can’t hover in midair etc.). | I have not attempted this part yet. |
| LO3: Use of shaders to apply parameter driven effects within the scene, e.g., light properties controlled using camera/character position. | I have not attempted this part yet. |