

Computer Graphics SET08116 – Coursework Specification

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General Information

Description

The aim of this coursework is twofold:

- (1) to create a 3D scene using OpenGL that demonstrates that you have a **solid understanding of Computer Graphics fundamentals**;
- (2) implement more **advanced Computer Graphics techniques** of your choice.

The coursework is split up into two parts, weighted 45% and 55%. The objective of the first part is to demonstrate your understanding of computer graphics principles: **you must implement a scene in which a prescribed set of features is implemented. These features are listed in the marking scheme.**

Part 2 will require you to implement more advanced prescribes features, but also give you the freedom to implement something that hasn't been covered in the practicals. Examples of possible advanced features are provided in lectures, but your choice is not limited to those suggestions. You may elect to focus on a single complex technique, or a number of simpler techniques combined in the same scene. You are strongly encouraged to discuss your ideas with your tutor to ensure that what you are proposing is suitable for this coursework.

Report

You are to deliver a report for the second part of the coursework, documenting what you intended to achieve, what you actually achieved and how. Your report must be written using the Napier Report Template, and delivered as a .pdf

github.com/edinburgh-napier/aux_latex_cw_template

Deliverables and Deadlines

Part 1 – 45%

A scene that exhibits graphical features listed in the marking scheme.

Submission deadline: Friday the **15th of March at 3pm**

Demonstration: You are required to briefly demonstrate your project and code to your tutor during the lab of the Week starting the 18th of March. **Only projects that will be demonstrated will be marked.**

Part 2 – 55%

A scene that exhibits more advanced Computer Graphics techniques (see marking scheme).

Submission deadline: Friday the **3rd of May at 3pm**

Part 1 - Marking Scheme

Component and Weighting

Associated Marks

Source Code 5%

Code quality

Your code should be readable and well commented.

3

Efficiency

Maintain a high framerate and low frame latency, no unnecessary processing and asset loading.

2

Graphical Features 40% - (All of these features are mandatory)

Multiple Cameras

Cameras of at least two different types should be selectable using key shortcuts.

8

Multiple lights and light types

8

Multiple models / Transform hierarchy

You are allowed to use primitives, but should also use models loaded from files. Demonstrate the use of transform hierarchies in a suitable scenario.

8

Texturing

Applying textures correctly to objects of varying shapes

8

Materials shading

Objects with materials that have different diffuse and specular and colour values. Use of Normal mapping

8

Part 2 - Marking Scheme

Component and Weighting	Associated Marks
Final Report 10%	
Formatting, References, Grammar	2
Content You should cover the work you have done in detail, explain any maths/theories required to implement your effects. Discuss any difficulties encountered. Mention anything you didn't manage to include with explanations / discuss future work.	8
Source Code 5%	
Code quality	3
Efficiency	2
Graphical Features 40%	
Shadowing Objects can cast and receive shadows, where appropriate.	10
Post-processing effects Selection of postprocessing effect.	10
Other features You will be assessed on the scope and quality of the features you have implemented. These features should not be direct applications of what was covered in the practicals.	20

Important Notes

There are some constraints to the scene that you will develop:

- Your scene must use the rendering framework developed during the practical part of the module. This framework is built using C++ and OpenGL.
- You need to provide screenshots of your scene from multiple viewpoints.
- You should have at least one interactive (user controllable) camera
- All coursework needs to be demonstrated prior to submission. This is to provide you with some initial feedback on the scene you have developed.
- Your coursework must be able to be compiled and executed on the D2 computers
- Your coursework should maintain a high framerate (60+fps) at a minimum of a 720p resolution

Note that you are expected to spend approximately 60 hours completing this assignment. How you split this time up depends on the scene you try to implement. However, you should aim to spend 10 hours a week working towards completing this coursework, including time spent on practical work.

Remember, you're required to submit a high quality report, screenshots, and professional videos emphasizing your graphical submission – in addition to source code that can be compiled without intervention.

Submission checklist

Coursework Part 1 <MATRIC>_set08116_cw1.zip	Coursework Part 2 <MATRIC>_set08116_2.zip
<ul style="list-style-type: none">• Screenshots• Source code• Working Release Executable	<ul style="list-style-type: none">• Final Report - <MATRIC>_cw2_report.pdf• Screenshots• Link to Video• Source code• Working Release Executable

Submission format Important notes

- Only submit your coursework files and content i.e., **do not** submit the entire SET08116 folder with the workbook and lab content.
- Your executable should be compiled in release mode. It **Must** work as a standalone executable (within a folder of assets).
- Package your submissions as **zip** files named <MATRIC>_set08116_cw[1/2].zip.
- Within the zip, have individual components in sensible locations.
- The Maximum file limit for each Zip file is 100MB.