Ahsanullah University of Science and Technology
Bangladesh

The Internal Audit and Moderation Form for the Courses with Projects to address (1) Complex Engineering Problem Solving, and (2) Complex Engineering Activities

Part 1: Moderation

1. **Course Code & Section**: *CSE 4204*

2. **Course Title**: *Computer Graphics Lab*

3. **Instructor(s)**: *Md. Reasad Zaman Chowdhury, Md. Rakibul Islam*

4. **Semester**: **Fall 2023**

5. **Title of the Project: A Medieval Castle**

6. **Brief Description of the Project:**

"A Medieval Castle," involves creating a 3D interactive model of a medieval castle using Three.js for rendering. The key features include textured castle walls and a drawbridge, which can be controlled through mouse interactions. The project also implements camera movement via keyboard inputs and simulates a day-night cycle by dynamically changing the sky's color. The focus is on performance optimization while maintaining realistic textures, lighting effects, and smooth animations. The project aims to provide an immersive, interactive 3D experience in a web environment.

7. Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Bloom's Taxonomy Level, Knowledge Profiles, Ranges of Complex Engineering (CE) Problem Solving, and CE Activities

Sl. No.	COs	POs	Bloom's Taxonomy			Knowledge Profiles	Ranges of CE Problem Solving	Ranges of CE Activities
			C	A	P			
1	Explain the fundamental concepts, functions and principles of computer graphics and graphics pipeline	a			2	***K3***	***P1***	
2	Apply 2D and 3D linear operations to perform various geometric and viewing transformations	b			3	***K2***	***P1***	
3	Design interactive computer graphics systems using the concept of the transformation, texture mapping and animation	c			4	***K5***	***P1, P2, P3, P4***	
4	Analyze various algorithms used in computer graphics to investigate their functionality and efficiency	d			4	***K8***	***P1***	
5	Utilize state-of-the-art graphics API and libraries to address computer graphics related problems	e			3	***K6***	***P1, P5, P7***	
6	Demonstrate communication strategies to effectively convey graphics concepts, project design, progress and outcomes to the appropriate audience	j			5			***A1, A2, A3***

8. The Seven Ranges of Complex Engineering Problem Solving related to the Project

"Complex Engineering Problems have characteristic P1 and some or all of P2 to P7"

Range	Attribute	PO	Relevance in the Project		Related CO
P1	Depth of Knowledge Required	PO1	K3 (A systematic theory-based formulation of engineering fundamentals required in the engineering discipline)	***Knowledge of 3D modeling, animation, and rendering for the castle using Three.js.***	***CO1***
		PO2	K4 (Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline)	***Advanced understanding of WebGL shaders and performance optimization techniques.***	***CO2***
		PO3	K5 (Knowledge that supports engineering design in a practice area)	***Application of 3D design principles for interactive environments.***	***CO3***
		PO5	K6 (Knowledge of engineering practice (technology) in the practice areas in the engineering discipline)	***Practical experience with real-time 3D rendering on web platforms.***	***CO5***
		PO4	K8 (Engagement with selected knowledge in the research literature of the discipline)	***Research into efficient algorithms for texture mapping and lighting effects.***	***CO4***
P2	Range of Conflicting Requirements	PO1 - PO7	***Balancing visual quality with performance optimization.***		***CO1 - CO7***
P3	Depth of Analysis Required	PO1 - PO7	***Analyzing animation, interaction, and rendering performance.***		***CO1 - CO7***
P4	Familiarity of Issues	PO1 - PO7	***Understanding 3D libraries (Three.js) and modern graphics hardware.***		***CO1 - CO7***
P5	Extent of Applicable Codes	PO1 - PO7	***Implementing web-based standards for compatibility.***		***CO1 - CO7***
P6	Extent of Stakeholder involvement and Conflicting requirements	PO1 - PO7	***User interaction design with keyboard and mouse controls.***		***CO1 - CO7***

P7	Interdependence	**PO1 - PO7**	***Coordinating drawbridge animation, lighting, and textures.***	***CO1 - CO7***

9. The Five Ranges of Complex Engineering Activities related to the Project (CO10)

"*Complex activities means (engineering) activities or projects that have some or all of the following characteristics*"

Range	Attribute	Relevance in the Project
A1: Involve the use of diverse resources (and for this purpose resources include people, money, equipment, materials, information and technologies)	Range of Resources	***Using Three.js, textures, and models, while coordinating interactions.***
A2 : Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues	Level of Interaction	***Addressing user input conflicts (keyboard, mouse) and smooth transitions.***
A3: Involve creative use of engineering principles and research-based knowledge in novel ways	Innovation	***Simulating real-world environments and interactivity in a 3D castle model.***
A4: Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation	Consequences for Society and the Environment	***Impacting the user's immersive experience with optimized 3D rendering.***
A5: Can extend beyond previous experiences by applying principles-based approaches	Familiarity	***Applying established methods in WebGL and Three.js for 3D environment.***

Signature of the Instructor/Course Coordinator: _____

Date:

Name:

10. Verifications *(To Be Completed by the Moderator)*

	Moderator 1
Recommended without any modification	☐
Recommended with some modifications (describe under the remark section below)	☐
Not recommended and the form should be rewritten and resubmitted (describe the reasons under the remark section below)	☐

Remarks (if any):

……

……

……

……

……

Signature of the Moderator:

_____

Date:

Name:

Part 2: Modifications (if any)

- □ All the required modifications have been done.
- □ Some/all of the modifications have not been done due to the following reasons:

……

……

……

……

……

Signature of the Instructor/Course Coordinator: _____

Date:

Name:

Part 3: Approval by the Head of the Department

Signature of the Head of the Department: _____

Date:

Name: