3D Graphics 2

Exam Information

Exam number
240

Items
24

Points
29

Prerequisites
3D Graphics 1

Recommended course length
One semester

National Career Cluster
Science, Technology, Engineering & Mathematics

Performance standards
Included (Optional)

Certificate available
Pilot

Description

This course is a continuation of 3D Graphics 1, where students will learn how to design and animate 3D models using specialized software. They will deepen their understanding of 3D graphics concepts, such as rigging, skinning, morphing, motion capture, and particle effects. They will also learn how to integrate sound, music, and voice into their 3D animations. They will showcase their creativity and talent by creating original 3D projects that demonstrate their mastery of 3D graphics.

Exam Blueprint

Standard	Percentage of exam
1. 3D Modeling	21%
2. Texturing and Materials	17%
3. 3D Lighting	24%
4. Asset Creation	17%
5. 3D Rendering	21%

Standard 1

3D Modeling:

Students will be able to identify proper modeling techniques for hard surface and organic models.

Objective 1 Students will demonstrate hard surface modeling techniques

1. Boolean operations
2. Subdivision surfaces
3. Box modeling
4. Patch Modeling

Objective 2 Students will demonstrate organic modeling techniques

1. Proper topology and edge flow techniques
2. Include sculpting
3. Retopology of sculpted objects

Performance Skills

1. Demonstrate hard surface and organic modeling techniques

Standard 1 Performance Evaluation included below (Optional)

Test Name

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher.

Student's Name: _____

Class: _____

Standard 2

Students will understand & use 3D Texturing and Materials

Objective 1 Students will demonstrate a strong understanding of the principles of texturing and materials creation, including color theory, texture mapping, and material properties.

1. Apply principles of color theory to create cohesive and effective 3D textures and materials.
2. Use UV mapping techniques to apply textures to 3D models
3. Utilize different material properties to create realistic and stylized shaders

Objective 2 Students will be able to use advanced texturing and material creation tools to create high-quality 3D textures and materials with a variety of properties and effects.

1. Use advanced texturing and material creation tools to create high-quality PBR 3D textures and materials
2. Create different material properties to create realistic and stylized materials

Performance Skills

1. Students will create and manipulate textures in a 3D graphic project.

Standard 3

Students will understand 3D Lighting

Objective 1 Students will demonstrate proficiency in using advanced lighting techniques and tools to create realistic or stylized lighting setups for 3D environments and models.

1. Lighting techniques to create realistic lighting setups.
2. Global illumination
3. Physically based rendering,
4. Create and optimize lighting pipelines

Objective 2 Students will be able to use lighting to enhance the mood, atmosphere, and storytelling of 3D projects.

1. Use lighting to create specific moods and atmospheres
2. Use lighting to enhance the storytelling of 3D projects

Performance Skills

1. Students will use advanced lighting techniques in a project.

Standard 4

3D Asset Creation

Objective 1 Students will demonstrate proficiency in creating 3D assets for a specific purpose, including game assets, animation assets, industrial design, etc.

1. Identify polycount limitation
2. Edge flow
3. High Poly
4. Low Poly

Objective 2 Students will be able to optimize and organize 3D assets for efficient use in their intended workflow.

Performance Skills

1. Students will understand asset creation and management.

Standard 5

3D Rendering

Objective 1 Students will demonstrate proficiency in setting up and optimizing rendering pipelines for different types of projects, including photorealistic, stylized, and real-time rendering.

1. Test renders
2. Instancing

Objective 2 Students will be able to use advanced rendering techniques and post-processing effects to create high-quality 3D renders with photorealistic materials and lighting.

1. Compositing
2. Color Correction

Performance Skills

1. Students will be able to apply advanced rendering techniques.

Workplace Skills

1. Communication
2. Problem Solving
3. Teamwork
4. Critical Thinking
5. Dependability
6. Accountability

Performance standards rating scale

0	Limited skills	2	→	4	Moderate skills	6	→	8	High skills	10

Standard 1 – Self awareness and careers **Score:**

- Identify four personal values and explain how these values affect behavior and choices.
- Research a Human Services career that includes educational requirements, skill development, and income potential.
- Will practice communication skills through public speaking using one or more of the following activities: memorized speech, prepared speech, extemporaneous speech, parliamentary practice, group presentation, or serving in a leadership capacity.

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Performance standard average score:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____