



Broward Community College

Course Outline

STATUS: A

COMMON COURSE NUMBER: TAR 2142C

COURSE TITLE: 3D Rendering

CREDIT HOURS: 3

CONTACT HOURS BREAKDOWN:

Lecture/Discussion 32

Lab 32

Other

Contact Hours/Week 4

CATALOG COURSE DESCRIPTION:

3D Rendering is the step after the formation of a building's skeleton (wire-frame bones and structure in the computer), where adding the surface textures, lighting and environmental context brings the pre-visualization of the project to life.

Prerequisite: ARC1056C, ETD1320

Corequisite:

UNIT TITLES:

1. Terminology and Vocabulary Related to Lighting, Texturing and Rendering
2. Understanding the Qualities of Lighting and Workflow Through Sensory Development
3. Understanding Materials and Rendering Algorithms Through Sensory Development
4. Defining a Scene Utilizing Context and Materiality
5. Compositing
6. Representation of Realism

I. Course Overview:

3D Rendering starts with the CAD models created in the computer. This step in the pre-visualization process adds realistic textures like brick, stucco, wood, steel, to the wire-framed models. Texture is added to surfaces like brick to give the illusion of coarseness, reflections are added to surfaces like mirrors and water, and transparency is added to glass, all in an effort to give a photo-realistic look to the final visualization. Lighting also is an integral part of the realism, from ambient lighting from the sun and clouds to artificial lighting fixtures inside and outside a structure. The final addition of human figures, landscaping, and other environmental features will give the building a sense of scale and context.

II. Units:

Unit 1. Terminology and Vocabulary Related to Lighting, Texturing and Rendering

General Outcome:

- 1.0 The students should be able to recognize, understand and be able to explain vocabulary and terminology related to 3D rendering.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Understand the meaning of the lighting, mapping and rendering vocabulary in the industry.
- 1.2 Explain all aspects of a visualization project utilizing specialized terminology.
- 1.3 Learn the interface and basic commands of the required software.
- 1.4 Learn how to import the CAD model into the software.

Unit 2. Understanding the Qualities of Lighting and Workflow Through Sensory Development

General Outcome:

- 2.0 The students should be able to understand the qualities of lighting and workflow through sensory development.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Understand and learn the function, characteristics and meaning of light sources such as, point (omni-directional) lights, spotlights, directional lights and area lights.
- 2.2 Understand how to use and apply the key light, fill light and backlight in a project and learn the relationship of three-point lighting in a three dimensional scene.
- 2.3 Apply softness, intensity and color to a scene.
- 2.4 Understand a shadow's functionality, interaction in spaces and use as a reproduction of a light or as a fake 3D model.
- 2.5 Understand how color is a factor when a scene is lighted and the meanings, balance, temperature and applicability of color.
- 2.6 Create a spectacular project by managing the lighting in a scene.

Unit 3. Understanding Materials and Rendering Algorithms Through Sensory Development

General Outcome:

3.0 The students should be able to understand materials and rendering algorithms.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

3.1 Understand and describe the fine art of seeing and dissecting by identifying the object, essence, material, light source, location, appearance, tactile quality and history in order to test intuitive sight.

3.2 Identify common mapping techniques by understand texture mapping as the art of adding variation to a surface that goes beyond the level of detail modeled into the geometry of the scene.

3.3 Describe and understand how 3D surfaces respond to light and how to adjust materials or shaders to obtain the most realistic shading.

3.4 Manage the specularly in a 3D surface.

3.5 Apply a texture to a specific material and modify it.

Unit 4. Defining a Scene Utilizing Context and Materiality

General Outcome:

- 4.0 The students should be able to define a scene utilizing context and materiality.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Setup the environment with background, land and landscaping.
- 4.2 Populate the scene with people, vehicles and additional accessories to make a scene come to life.
- 4.3 Create rich scenes by adding appropriate props.

Unit 5. Compositing

General Outcome:

5.0 The students should be able to understand all the elements of compositing.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Complete 3D renderings displaying complexity, quality and speed by rendering in multiple layers or passes.
- 5.2 Understand that compositing is the art of combining multiple images into a unified final scene allowing for efficient rendering, increased creative control, and convincing integration by using live-action footage and rapid revisions.

Unit 6. Representative of Realism

General Outcome:

5.0 The students should be able to understand all the elements that are representative of realism.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

6.1 Choose the right views for final rendering.

6.2 Create a realistic scene on high resolution definition for a final project.

Unit 7. Visualization as a Final Presentation

General Outcome:

- 7.0 The students should be able to understand all the elements that constitute visualization as a final presentation.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 7.1 Create a final high resolution visualization of the walkthrough with all the elements in a scene.
- 7.2 Critically evaluation the results of the final presentation in terms of the work environment and a client based situation.