

AAD 0083 - INTRODUCTION TO THREE-DIMENSIONAL MODELING

Catalog Description

Advisory: Completion of AAD 70 and ART 4A with grades of "C" or better
Hours: 108 (27 lecture, 81 laboratory)

Description: Three-dimensional modeling on the computer including construction of three-dimensional forms, use of surface textures, application of lighting effects, and animation of completed constructions. Students will create original projects including environments, objects, buttons, three-dimensional texts and animations for use in fine art, graphic design, multimedia and the World Wide Web. (CSU)

Course Student Learning Outcomes

- CSLO #1: Investigate requirements for 3D animations and projects, including software and hardware options and requirements.
- CSLO #2: Design and construct 3D models and projects using professional techniques and processes, such as lighting and surface applications.
- CSLO #3: Critique the effectiveness of completed 3D projects.

Effective Term

Spring 2021

Course Type

Credit - Degree-applicable

Contact Hours

108

Outside of Class Hours

54

Total Student Learning Hours

162

Course Objectives

Lecture Objectives:

1. Identify the characteristics of various 3D rendering software applications;
2. Identify specific software, platform, format, and memory considerations in the development, integration, and output of 3D Rendering I;
3. Determine the rendering time required in the creation of a 3D object, using the appropriate tools, settings, and resolution;
4. Integrate 3D rendering into another image or animation; and
5. Evaluate projects in terms of their construction, lighting, texture, color, and overall effectiveness.

Laboratory Objectives:

1. Create a 3D rendered object using profiles, surface changes, scaling, deforming, and assembling from multiple elements;
2. Create a 3D project which includes animation of the 3D objects;

3. Create a 3D project demonstrating understanding of materials and lighting effects;
4. Critique projects in terms of their construction, lighting, texture, color, and overall effectiveness.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Projects
 - Example: Students are assigned a project to create a 3D rendered object using profiles, surface changes, scaling, deforming, and assembling from multiple elements. Rubric Graded.
- Skill Demonstrations
 - Example: Students will determine the rendering time required in the creation of a 3D object using the technical requirements and inclusion of specific design concepts studied. Rubric Graded.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. The instructor will demonstrate techniques using written directions and students will follow this process to create 3D models of objects and figures. Students will complete the assigned set of criteria.

Lecture:

1. The instructor will lead a discussion on how to develop solutions to specific 3D design problems. Design solutions are reviewed by the class; with the instructor acting as facilitator and guide. Multiple solutions are possible, but students are expected to actively participate in the lecture and articulate opinions and reasoned evaluations of the design.

Distance Learning

1. The instructor will provide an accessible lecture overview along with video and/or images of how to successfully complete projects relating to 3D modeling, texturing, and lighting. The instructor will demonstrate how to source, modify and create custom textures to mimic tangible surfaces. Students are required to demonstrate their practice and competency with the techniques through documentation of their work through video or images that will be submitted via the LMS. In addition, students will then respond to prompts with written submissions to share where they succeeded and where there is room for growth in their practice.

Typical Out of Class Assignments

Reading Assignments

1. Read chapter on 3D framing techniques from class textbook in preparation for hands-on demonstration/tutorials by instructor in class and for examinations on course content and terms. 2. Develop 3D images for projects through library and internet-based research focusing on content, and preparation of written objectives using the concepts and terminology for successful completion of the assignment.

Writing, Problem Solving or Performance

Assignment 1: Creating Animating Orbits This assignment will give you a quick primer on the Maya interface and will take you through the creation of a Solar System project and the mechanics of animating orbits. With the Solar System exercise, you'll dive into creating simple objects, setting keyframes, and stacking your animation to get planets and moons to orbit each other and the Sun. This will expose you to: 1. Object creation 2. Simple modeling 3. Object components 4. Pivot point placement 5. Grouping 6. Hierarchies 7. Basic keyframing 8. Timing Topics in this assignment include: 1. You Put the U in UI 2. Project Overview: The Solar System 3. The Preproduction Process: Planning 4. Creating a Project 5. The Production Process: Creating and Animating the Objects 6. Maya Object Structure 7. Using the Outliner 8. Outputting your Work Assignment 2: Modeling Complex Objects: The Classic Steam Locomotive This exercise will demonstrate the following polygonal modeling techniques. This will expose you to: 1. Extrusion 2. Insert Edge Loop and Wedge Face tools 3. Object duplication 4. Pivot placement 5. CV curves and revolved surfaces 6. Complex model hierarchy Now you are going to start to create a rather complex-looking object, an old-fashioned steam locomotive, using mostly polygons. You will use a schematic printout of the final model as a reference for your model. Because this is a complicated object, it's much better to start with good plans. This will involve some research, web surfing, image gathering, and/or sketching to get a feel for what you're trying to make.

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Introducing Maya® 2016
 - Author: Dariush Derakhshani
 - Publisher: Wiley Publishing Inc.
 - Publication Date: 2015
 - Text Edition: 1st
 - Classic Textbook?: No
 - OER Link:
 - OER:
- Introduction to 3D Graphics & Animation Using Maya
 - Author: Adam Watkins
 - Publisher: Thomson Learning – Charles River Media
 - Publication Date: 2007
 - Text Edition: 1st
 - Classic Textbook?: No
 - OER Link:
 - OER:
- Maya 2008 Character Modeling and Animation Principles and Practices

- Author: Tereza Flaxman
- Publisher: Thomson Learning – Charles River Media
- Publication Date: 2008
- Text Edition: 1st
- Classic Textbook?: No
- OER Link:
- OER:

Other materials and-or supplies required of students that contribute to the cost of the course.

USB flash drive 8.5 x 11 sketchpad pencils and markers