Course of Study 3-D Computer Art & Animation

Course Description:

In 3-D Computer Art & Animation, students will learn the principles of 3-D animation while creating projects using industry-based 3-D software. Through various projects, students will utilize skills acquired in academic courses while modeling objects, creating actions, and composing computerized animations.

Course Credit:

This course counts as 1/2 credit of General Elective or Technology or Art.

Purpose of Course:

In 3-D Computer Art & Animation, students will learn the principles of 3-D animation while creating projects using industry-based 3-D software. The course is learned through hands-on instructions while emphasizing student creativity. Students will construct 3-D models, animate models through created actions, and utilize models in a 3-D animated environment.

Course Content:

Unit	Standard Clusters
Demonstrate knowledge of the basic principles of 3-D modeling	• Explain how to convert objects from two-dimensional to three-dimensional • Explain how a computer deals with geometry • Identify the software available for 3-D modeling • Explain the steps for building a 3-D model • Define the components of a wireframe model
Create 3-D models	• Create a model using 3-D modeling software • Determine desired camera angle • Adjust lighting angle, focus, and color to achieve desired effect • Adjust surface color, texture, transparency, and reflectivity to achieve desired effect • Compare/contrast flat shading, curved shading, ray tracing, and radiosity methods • Render the object using flat shading • Render the object using curved shading • Render the object using ray tracing • Combine models to create a scene • Render the complete scene
Perform advanced 3-D image generation techniques	• Follow basic animation principles • Perform basic texture-mapping algorithms • Perform basic antialiasing • Perform basic volume-rendering algorithms • Develop basic curves and surfaces • Perform surface detail modeling
Utilize the basic principles of 3-D animation	• Create pre-rendered 3-D animation • Create real-time Virtual Reality Mark-up Language 3-D animation
Develop animated characters	• Design a character based on a narrative context • Develop characters in accordance with designs • Animate a character so as to express its nature • Develop and/or capture motion • Design 3-D models of characters
Create 3-D environments	• Create and/or import buildings, rooms, land forms, and bodies of water • Incorporate fog and background images • Manipulate particle systems such as rain and snow • Apply lighting effects • Add special effects

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	• Code object intelligence into a 3-D environment
Demonstrate knowledge of virtual environment	• Explain the basic principles of virtual environment • Explain the principles of geometry relative to virtual environment • Differentiate virtual environment files format • Manage polygon resources • Create a basic virtual environment

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