

Course Description

DIG1302 | 3D Modeling | 4.00 credits

This course is for students majoring in Animation and Game Art and introduces environmental design. Students will learn the concepts, hardware, and software related to digital image acquisition, image editing, manipulation, color management basics, masking, layering, retouching, scanning and output, and color theory as it relates to digital media. Knowledge or proficiency in Adobe Photoshop and Illustrator recommended. (3 hr. lecture)

Course Competencies

Competency 1: The student will demonstrate how to use animation software to create geometric forms by:

1. Creating geometric forms utilizing points, vectors and polygons and curves
2. Discussing the application of Open GL and how pixels, light and RGB colors are displayed on a computer screen
3. Manipulating objects quickly in perspective, top, side and front views simultaneously

Learning Outcomes

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Demonstrate an appreciation for aesthetics and creative activities

Competency 2: The student will demonstrate knowledge of how to create complex three-dimensional (3D) forms by:

1. Utilizing primitive shapes to model 3D forms
2. Describing the difference between non-uniform rational B splines (NURBS), polygons and sub division surfaces and applying these techniques to create 3D forms
3. Using Boolean functions and Maya polygonal modeling toolset (extrude, lattices etc.) to create 3D forms
4. Manipulating points, vertices, edges and faces to create 3D forms
5. Utilizing Mesh Topology at different mesh resolutions
6. Demonstrating knowledge of polygon modeling

Learning Outcomes

- Use computer and emerging technologies effectively

Competency 3: The student will demonstrate knowledge of spline curves and how to create 3D curvilinear forms by:

1. Creating and using loft, planar, lathe and other NURBS surface tools
2. Creating complex geometric forms from curves
3. Converting curves into polygons and a variety of other objects

Competency 4: The student will demonstrate the ability to map detailed textures to complex 3D objects by:

1. Rendering algorithms
2. Explaining how pixels in an image are created from Maya
3. Creating a 3D object in Maya from a sketch
4. Discussing different types of techniques available in Maya to apply texture and how light interplays with a computer surface
5. Describing how Open GL display works with texture mapping and gaming

Course Competency 5: The student will demonstrate the ability to create and render a 3D image by:

1. Describing the differences between various rendering engines (e.g., Arnold)
2. Creating 3D cameras to produce depth of field, motion blur and exposure effects
3. Creating a photorealistic render