AN3D 2320 - 3D COMPUTER LIGHTING + MATERIALS

Credits: 3

Building on the skills and knowledge gained in 3D Computer Fundamentals, this intermediate-level course will focus on lighting techniques, materials creation, and UVW mapping, including the integration of these practices with the storytelling aspect of film making. The study of lighting theory is also applied as it relates to the synthetic animation environment. The student gains further practical experience with the software user interface, workflow pipeline, project management, and rendering. Upon successful completion of the course, students will have produced refined 3D digital images that demonstrate their ability to create and manipulate lighting and textured surfaces in a 3D animation environment.

Prerequisites: AN3D 1210 - 3D Computer Fundamentals and AN 2270 - Digital Painting for Film + Games

Notes: (Formerly AN3D 2220)

Course Learning Outcomes:	Exceeding	Meeting	Developing	Not meeting	Program Outcomes	Institutional Outcomes
Apply lighting and surfacing techniques to create scenes with elements of visual storytelling.	Utilizes lighting and surfacing to emphasize emotional tone of the shot or scene. All of the following elements have been incorporated intentionally and with great impact: ▫ light position, ▫ damage, ▫ characterization, ▫ camera position	Utilizes lighting and surfacing to emphasize emotional tone of the shot or scene. At least two of the following elements have been incorporated intentionally: ▫ light position, ▫ damage, ▫ characterization, ▫ camera position	Utilizes lighting and surfacing to emphasize emotional tone of the shot or scene. One of the following elements has been incorporated intentionally: ▫ light position, ▫ damage, ▫ characterization, ▫ camera position	Little emphasis on emotional tone is evident in the shot or scene.	AN3D-1, AN3D-3, AN3D-6	Critical Thinking Design Competence
Properly apply techniques for 3D asset surfacing.	Texture maps are produced utilizing multiple methods and software packages, and represent a variety of stylistic design choices. Methods include all of the following processes, with attention to increased efficiency: ▫ hand-painting 2D textures, ▫ mesh-painting textures, ▫ creating derivative textures from photographs, ▫ sculpting/baking custom textures, ▫ modifying purchased/found textures, ▫ procedurally generating textures	Texture maps are produced utilizing multiple methods and software packages, and represent a variety of stylistic design choices. Methods include at least three of the following processes: ▫ hand-painting 2D textures, ▫ mesh-painting textures, ▫ creating derivative textures from photographs, ▫ sculpting/baking custom textures, ▫ modifying purchased/found textures, ▫ procedurally generating textures	Texture maps are produced utilizing few methods and software packages, and represent limited stylistic design choices. Methods include less than three of the following processes: ▫ hand-painting 2D textures, ▫ mesh-painting textures, ▫ creating derivative textures from photographs, ▫ sculpting/baking custom textures, ▫ modifying purchased/found textures, ▫ procedurally generating textures	Texture maps are sloppily produced utilizing limited methods and software packages. Stylistic design choices are not evident or are inconsistent. Only one method of the following processes is evident: ▫ hand-painting 2D textures, ▫ mesh-painting textures, ▫ creating derivative textures from photographs, ▫ sculpting/baking custom textures, ▫ modifying purchased/found textures, ▫ procedurally generating textures	AN3D-1, AN3D-2, AN3D-6	Critical Thinking Design Competence
Create custom material networks utilizing native software tools.	Node-based texture networks are comprised of fundamental maps (diffuse, specular, bump), incorporate mathematics functions, and are modified by procedural elements to create an accurate representation of the chosen surface	Node-based texture networks are comprised of fundamental maps (diffuse, specular, bump) in addition to at least three mathematics functions, and come close to emulating the chosen surface	Node-based texture networks rely solely on fundamental maps, and do not utilize mathematics functions. Material may only vaguely resemble chosen surface	Node-based texture networks are entirely procedural (math-based), or are missing essential maps for surface emulation. Material does not represent chosen surface	AN3D-1, AN3D-2, AN3D-3, AN3D-6	Critical Thinking Design Competence
Demonstrate visual storytelling concepts as related to look development via 3D rendered scenes.	Scale, shape, color and texture are consistently evident in design decisions. Assets are unique, visually cohesive, balanced aesthetically, and have a distinct sense of individuality and personality with little to no flaws.	Scale, shape, color and texture are evident in design decisions. Assets are mostly unique, and exhibit individuality, personality and visual cohesion with minor flaws.	Scale, shape, color and texture are evident in few design decisions. Assets are derivative, visually inconsistent and lack personality.	Scale, shape, color and texture are rarely evident in design decisions. Assets are incomplete, derivative, inconsistent or unrecognizable.	AN3D-3, AN3D-6, AN3D-8	Critical Thinking Design Competence
Apply textures, hand-painted and/or derived from photographs, to 3D models.	Textures derived from hand-painting or photographic means consistently emulate surface attributes, with minor flaws or variance.	Textures derived from hand-painting or photographic means consistently emulate surface attributes, with minor flaws or variance.	Textures derived from hand-painting or photographic means consistently emulate surface attributes, with minor flaws or variance.	Textures derived from hand-painting or photographic means consistently emulate surface attributes, with minor flaws or variance.	AN3D-1, AN3D-3	Critical Thinking Design Competence
Produce clean, functional UV maps.	UV maps contain no overlapping or twisting, are laid out in 0 to 1 space (or accurately utilze UDIMs for ultra-high resolution production meshes) exhibit no distortion, are scaled for consistency and have adequate padding based on destination texture resolution	UV maps contain no overlapping or twisting, are laid out in 0 to 1 space, exhibit minimal distortion, are scaled for consistency and have adequate padding based on destination texture resolution	UV maps contains minimal overlapping or twisting, are laid out in 0 to 1 space, exhibit noticeable distortion, are not scaled for consistency and have irregular padding based on destination texture resolution	UV maps contain excessive overlapping or twisting, are laid out beyond 0 to 1 space, exhibit extreme distortion, are not scaled for consistency and do not have adequate padding based on destination texture resolution	AN3D-1, AN3D-2, AN3D-6	Critical Thinking Design Competence