VCIL-1640: 3D DESIGN

Cuyahoga Community College

Viewing: VCIL-1640 : 3D Design

Board of Trustees:

February 2019

Academic Term:

Fall 2020

Subject Code

VCIL - VC-Illustration

Course Number:

1640

Title:

3D Design

Catalog Description:

Technical and aesthetic fundamentals of 3D Design. Use of industry standard software to develop 3D graphics for screen and print applications. Projects may include 3D design and visualization for information graphics, product visualization, prototyping, logo design and environmental visualization. Various design techniques including 3D parametric modeling, polygonal modeling and Subsurface modeling solutions. Introduces basic modeling, staging, lighting, texture and shader strategies to realize 3D concepts.

Credit Hour(s):

3

Lecture Hour(s):

2

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

VC-1000 Visual Communication Foundations or concurrent enrollment; or departmental approval.

Outcomes

Course Outcome(s):

Develop 3D graphics for screen & print applications using industry standard software.

Objective(s):

1. Describe various 3D modeling tools and systems used by 3D visualization industry.
2. Identify primary 3D primitive, parametric and polygonal building blocks of 3D modeling.
3. Modify primitive polygons into complex models by using move, scale, rotate and extrusion of fundamental polygon components.
4. Experiment with different modeling strategies including primitive modeling, box modeling, patch modeling, Non-Uniform Rational Basis Spline (NURBS) modeling, subdivision modeling and other spline and polygon based modeling strategies.
5. Explain benefits of low polygon and efficient geometry modeling vs. high polygon count modeling.
6. Identify and implement basic light objects including spot, omni, point, area, infinite, sky, polygon, target lights along with other lighting systems and their differentiating factors.
7. Demonstrate basic uses of materials, textures and shaders in a 3D environment.

Course Outcome(s):

Produce a 2D rendering based on 3D design for information graphics, product visualization, prototyping, logo design, environmental visualization or related design/media project.

Objective(s):

1. Explore using reference images to build proportional and accurate representations in a 3D environment.

2. Demonstrate effective use of multi-viewport modeling environment (front, left, top, perspective, camera, etc).

Methods of Evaluation:
1. Written assignments
2. Laboratory exercises
3. Case studies
4. Projects
5. Presentations
6. Portfolio

Course Content Outline:
1. 3D Modeling Environment
   a. Viewport System
      i. Front/Back
      ii. Right/Left
      iii. Top/Bottom
      iv. Perspective
      v. Isometric
      vi. Camera
      vii. Custome
   b. Pan, Dolly, Roll and Frame
   c. X,Y,Z and Coordinate System
      i. World Space
      ii. Origin
      iii. World vs. Model Coordinates
      iv. Pivots and Axis
2. 3D Modeling
   a. Parametric 3D Objects
      i. Size vs. Scale
      ii. Segmentation X,Y & Z
      iii. High vs. Low Polygon
      iv. Orientation
      v. Fillet
      vi. Caps
      vii. Phong
   b. Null
   c. Splines
      i. Bezier
      ii. B-Spline
      iii. Freehand
      iv. Shape
      v. Text
      vi. Complex
   d. Subsurfaces
      i. HyperNURBS
      ii. Lathe
      iii. Extrude
      iv. Loft
      v. Sweep
   e. Selections
      i. Live
      ii. Rectangle/Marquee
      iii. Soft
      iv. Loop
      v. Grow

    vi. Visible
    vii. Sets
  f. Edit Polygon
    i. Point/Vertex
    ii. Edge/Segment
    iii. Polygon/Face
  g. Modify Geometry
    i. Move
    ii. Rotate
    iii. Scale
    iv. Extrusion
    v. Bevel
    vi. Segment
  h. Reference Image & Design
    i. Design/Drawing
    ii. Placing
    iii. Scaling
    iv. Transparency

3. Lighting
  a. Light Objects
    i. Omni
    ii. Point
    iii. Spot
    iv. Area
    v. Geometric
    vi. Target
  b. Strategies
    i. Single & Multi Point
    ii. Temperature
    iii. Color
    iv. Intensity
    v. Staging
    vi. Emulating Real World Conditions
  c. Shadows
    i. Soft
    ii. Hard
    iii. Area
    iv. Color
    v. Density
  d. Effects
    i. Falloff
    ii. Volumetric
    iii. Cookies
    iv. Caustics
    v. Noise

4. Texturing
  a. Procedural Shaders
  b. Projection
    i. UVW (UV)
    ii. Geometric
  c. Material Channels
    i. Color
    ii. Luminosity
    iii. Diffusion
    iv. Transparency
    v. Bump
    vi. Displacement
    vii. Reflection

Resources

Tickoo, Sham. *MAXON CINEMA 4D R19 Studio: A Tutorial Approach*. CADCIM Technologies; 6 edition , 2018.

Grey Scale Gorilla. 2018. https://greyscalegorilla.com

Creative BLOQ Art and Design Inspiration. Bath, UA: Future Publishing Limited Quay House, 2018. https://www.creativebloq.com/

CGSociety: Networking platform for professional digital artists. 2018. https://cgsociety.org

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ArtStation. Ballstiq Digital Inc., 2018. https://www.artstation.com

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Sketchfab. New York, NY: Sketchab, 2018. https://sketchfab.com

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The Polycount Newfeed. 2018. https://polycount.com

C4D Cafe. 2018. http://www.c4dcafe.com

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