

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

OFSY 612

COURSE TITLE

3D MODELING

TYPE COURSE

NON-FEE

VOCATIONAL

CATALOG COURSE DESCRIPTION

This course provides instruction in 3D computer modeling. 3D applications are used to create computer generated 3D models and animations used in the fields of science, engineering, architecture and multimedia. 3D models and animations can be imported into Web pages, video editing and interactive authoring applications. (FT)

LECTURE/LABORATORY HOURS

110

ADVISORY

NONE

RECOMMENDED SKILL LEVEL

Eighth grade reading level, communicate effectively in the English language, have an understanding of basic design principles, and possess basic computer skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking
SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development
SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self-advocacy skills to cope with changing situations in their lives.

COURSE GOALS

This course provides instruction in 3D modeling; provides the opportunity for students to demonstrate competence through hands-on projects and portfolio pieces, enhances communication skills through group or team projects, improves design skills through assigned projects, affords technical skill in applying proper file formats to projects, develops software and hardware troubleshooting skills, and provides “real world” experiences to increase awareness of necessary job skills and career opportunities.

COURSE OBJECTIVES

Upon successful completion of this course, the student will be able to:

1. Describe the minimum system requirements.
2. Define and describe the terminology, basic tools, and techniques necessary to create 3D models and animations.
3. Create models and animations.
4. Work with 2D and 3D vectors, including paths, Bezier curves and splines.
5. Identify and apply the best mode, file format, resolution, color depth, and compression scheme for a project.
6. Place raster images.
7. Apply special effects.
8. Edit images.
9. Work with different file formats.
10. Import and export 3D models and animations to other applications.
11. Port a file cross platform.
12. Troubleshoot hardware and software problems.
13. Evaluate a 3D model or animation for appropriateness to a project.
14. Work on a team to bring a project to completion.
15. Analyze the needs of a project.

SECTION II

COURSE CONTENT AND SCOPE

1. Introduction - Basic Concepts
 - 1.1. Planning a project
 - 1.2. Hardware requirements
 - 1.3. Understanding the basic features of 3D modeling
 - 1.4. Understanding the differences between 2D and 3D objects
 - 1.5. Working with primitive shapes
 - 1.6. Using the tools
 - 1.7. Modeling space
 - 1.8. Display modes - wire frame, hidden wire frame, solid
 - 1.9. Navigating in 3D space
2. Creating Basic Shapes
 - 2.1. Straight lines
 - 2.2. Bezier curves
 - 2.3. Polygons
 - 2.4. Text
 - 2.5. Open paths
 - 2.6. Closed paths
 - 2.7. Splines
3. Creating Type
 - 3.1. Text objects
 - 3.2. Text formatting
 - 3.3. Text Transformation
4. Selecting and Editing Objects and Paths
 - 4.1. Selecting objects
 - 4.2. Rotating objects
 - 4.3. Moving objects
 - 4.4. Copying objects
 - 4.5. Deleting objects
 - 4.6. Editing paths
 - 4.7. Aligning and distributing objects
 - 4.8. Grouping and locking objects
 - 4.9. Special tool considerations
5. Lighting
 - 5.1. Understanding difference between global and directional lights
 - 5.2. Setting lights
 - 5.3. Glowing objects
 - 5.4. Shadows
 - 5.5. Gels
 - 5.6. Time of day lighting
 - 5.7. Setting intensity
6. Light Source
 - 6.1. Spotlight
 - 6.2. Point
 - 6.3. Ambient

COURSE CONTENT AND SCOPE (CONTINUED)

- 6.4. Distant
- 6.5. Pan
- 6.6. Back
- 7. Transformation Tools
 - 7.1. Scaling
 - 7.2. Rotating
 - 7.3. Reflecting
- 8. Materials
 - 8.1. Understanding surface quality
 - 8.2. Understanding shadows
 - 8.3. Understanding reflections
- 9. Modeling
 - 9.1. Constructing objects
 - 9.2. Extrusion
 - 9.3. Lathing
 - 9.4. Skinning or lofting
 - 9.5. Sweeping
 - 9.6. Molding
 - 9.7. NURBS modeling
 - 9.8. Polygon count and optimization
- 10. Morphing
 - 10.1. Transitions
 - 10.2. Distortions
- 11. Textures
 - 11.1. Creating textures
 - 11.2. Surface textures
 - 11.3. Mapping
 - 11.4. Importing from other applications
- 12. Animation
 - 12.1. Creating and editing animation path
 - 12.2. Working with animation time line
 - 12.3. Key frames and events
 - 12.4. Camera moves
 - 12.5. Playing back
 - 12.6. Using special animation commands (bounce)
- 13. Cameras
 - 13.1. Orientation
 - 13.2. Depth of field
- 14. Building Scenes
 - 14.1. Parents and children
 - 14.2. Backgrounds
 - 14.3. Atmosphere
- 15. Animation Formats
 - 15.1. Numbered still images (sequence)
 - 15.2. QuickTime
 - 15.3. Video frame by frame recording

COURSE CONTENT AND SCOPE (CONTINUED)

- 16. Rendering
 - 16.1. Selecting appropriate rendering method for project
 - 16.1.1. Realism
 - 16.1.2. Detail
 - 16.1.3. Anti-aliasing
 - 16.1.4. Smoothness
 - 16.1.5. Speed
 - 16.2. Environmental effects
 - 16.3. Wireframe
 - 16.4. Flat shading
 - 16.5. Gouraud shading
 - 16.6. Phong
 - 16.7. Phong reflection
 - 16.8. Raytracing
 - 16.8.1. Mirror reflection
 - 16.8.2. Recursion
 - 16.8.3. Transparency
 - 16.8.4. Refraction
 - 16.9. Radiosity
- 17. Working with Other Applications
 - 17.1. Understanding vector and raster files
 - 17.2. Alpha channel
 - 17.3. Color depth
 - 17.4. Importing from other applications
 - 17.5. Exporting to other applications
 - 17.6. Selecting proper file format for project
- 18. Resolving Common Hardware and Software Problems on Macintosh and IBM Computers
 - 18.1. Organizing files
 - 18.2. Managing memory
 - 18.3. Selecting the best hardware and software for the project within budgetary constraints
 - 18.4. Storage
 - 18.5. Networking
 - 18.6. Cross-platform issues
 - 18.7. Special tool considerations

APPROPRIATE READINGS

Appropriate readings may include, but are not limited to, periodicals, magazines, instructor-written materials, manuals and other publications related to design and 3D modeling.

WRITING ASSIGNMENTS

Appropriate writing assignments may include, but are not limited to, preparing text for an assigned project, identifying and listing industry standards, preparing a list of current software and hardware used in the field of multimedia and 3D modeling, maintaining a portfolio of class assignments and providing written answers to specific questions related to 3D modeling and

design.

OUTSIDE ASSIGNMENTS

Outside assignments may include, but are not limited to, reading texts, reference resources or handouts; research as needed to complete projects; and organizing and preparing written answers to assigned questions.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Assignments which demonstrate critical thinking may include, but are not limited to, written and oral analysis and evaluation of readings and/or classroom materials; design and selection of appropriate features or application software to complete a project, understanding limitations of

3D modeling features, the incorporation of appropriate design elements, and prioritization of multi-task projects.

EVALUATION

Evaluation will be based on performance in a variety of activities and assignments such as:

1. Written and practical tests.
2. Completion of assigned projects.
3. Attendance and punctuality.
4. Completion of performance objectives.
5. Participation in class activities.
6. Working on projects with classmates.
7. Creation of a portfolio.

Upon successful completion of each individual course a Certificate of Course Completion will be issued. Upon successful completion of all courses included in the program a Certificate of Program Completion will be issued.

METHOD OF INSTRUCTION

Methods of instruction will include, but not be limited to, lecture, self-paced lab, demonstration, individualized study, use of audio-visual aids, tutorials, group/team work and other unique instructional strategies such as, field trips, job shadowing, volunteering and guided student job assignments may be utilized. This course, or sections of this course, may be offered through distance education.

TEXTS AND SUPPLIES

Texts:

The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators, Richard Williams, Faber & Faber

3D Graphics & Animation (2nd Edition), Mark Giambruno, New Riders Publishing

TEXTS AND SUPPLIES (CONTINUED)

Modeling a Character in 3DS Max, Paul Steed, Wordware Publishing

3ds Max 4 for Windows: Visual QuickStart Guide, Michele Matossian, Peachpit Press

Digital Character Animation 2: Essential Techniques, George Maestri, Riders Publishing

Animating Facial Features and Expressions, Bill Fleming, D.Dobbs, Charles River Media

The Animation Book, Kit Laybourne, Three Rivers Press

Sams Teach Yourself 3D Studio Max 3 in 24 Hours, Dave Kalwick, Sams

LightWave 3D 7.0 Character Animation (with CD-ROM) Timothy Albee, Wordware Publishing

Magazines and E-zines:

Animation Magazine <http://www.animationmagazine.net/>

3D World <http://www.3dworldmag.com/>

Animation World Magazine <http://www.awn.com/>

C3 Mag <http://www.c3mag.com/>

Strata User, Zetta Stone Publishing

Syllabus, Syllabus Press

T.H.E. Journal: Technological Horizons In Education - Technology For Education, T.H.E. Journal L.L.C.

Web Sites:

<http://www.discreet.com/products/3dsmax>

<http://www.3dlinks.com>

http://www.maxon.net/index_e.html

<http://www.adobe.com>

<http://www.apple.com>

<http://www.strata3d.com>

<http://www.syllabus.com>

Software Recommended:

3D Studio Max – now called 3ds

Swift 3D by Electric Rain

Other 3D software could include:

Cinema 4D, Maya, General 3D, Lightwave, Poser, Rhino, Softimage, Shockwave 3D, Strata 3D, Truespace, Animation Master

Online Video Training:

Lynda.com

VTC.com

Tools:

Computer that exceeds the 3D program's recommended system requirements

Storage:

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Blank CDs, DVDs, USB drives, etc.

Other tools:

Flatbed scanner

Digital camera

Screen Capture Software

Optional tool considerations:

Adobe Photoshop

Plug-Ins

Drawing Tablets

Color printer

PREPARED BY: Karen Owen DATE: November 30, 1997

REVISED BY: Paul Richard DATE: February 22, 2007

REVISED BY: Instructional Services, SLOs added DATE: March 7, 2017

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog