Level 2—Advanced NURBS modeling with Rhino

Course Outline

This course is geared to individuals who will be using and/or supporting Rhino. The course explores advanced techniques in modeling to help participants better understand how to apply Rhino's modeling tools in practical situations.

In class, you will receive information at an accelerated pace. For best results, practice at a Rhino workstation between class sessions, and consult your Rhino reference manual for additional information.

Duration

3 days

Prerequisites

Completion of Level I training, plus three months experience using Rhino is recommended.

Target Audience

This course is for the design professional who wants to efficiently learn advanced concepts and features of the Rhinoceros modeling software at an accelerated pace in an instructor-lead environment.

Course Objectives

In Level 2, you learn how to: Construct and modify curves that will be used in surface building using control point editing methods

- Evaluate curves using the curvature graph
- Use a range of strategies to build surfaces
- Rebuild surfaces and curves
- Control surface curvature continuity
- Create, manipulate, save and restore custom construction planes
- Create surfaces and features using custom construction planes
- Group objects
- Visualize, evaluate, and analyze models utilizing shading features
- Place text around an object or on a surface
- Map planar curves to a surface
- Create 3-D models from 2-D drawings and scanned images
- Clean up imported files and export clean files
- Use rendering tools

Curriculum

Day 1—AM

Productivity Tools and

Rhino's customization tools make it easy to create and modify toolbars and buttons. Adding to the flexibility is the ability to combine commands into macros to accomplish more complex tasks. In addition to toolbar customization, it is possible to set up command aliases and shortcut keys to accomplish tasks in Rhino.

After a brief warm-up exercise, the following concepts will be covered:

- Customize toolbars and toolbar collections
- Create simple macros
- Load and run scripts
- Load plug-ins

NURBS Concepts

Gaining an understanding of NURBS structure is useful in deciding which strategies to use when creating or editing geometry. The second part of the morning session will focus on the following concepts.

- NURBS topology
- Continuity
- Using curvature graphs

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Surface Continuity

The continuity characteristics for curves can also be also applied to surfaces. Rhino takes advantage of the OpenGL display capability to create false color displays for checking curvature and continuity within and between surfaces. Surface continuity concepts will be covered in the afternoon session including:

- Use of a range of strategies to build surfaces
- Rebuilding surfaces and curves
- Controlling surface curvature continuity
- Analyzing surface continuity

Day 2—AM

Advanced surfacing

A general approach to modeling is the focus of this session with the following topics discussed:

- Create surfaces and features using custom construction planes
- Group objects
- Visualize, evaluate, and analyze models utilizing shading features
- Using History

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More advanced surfacing

This session focuses on some very specific modeling problems that make use of the continuity tools. Specifically making surfaces that have a crease at one that gradually changes to a smooth transition at the other end and making a cutout scoop on a free-form surface.

Day 3—AM

Using 2D drawings and images,

Often you are asked to take an existing design from a 2-D graphics package and include it as part of a Rhino model. In this part of the session the following techniques will be discussed:

- Place text around an object or on a surface
- Map planar curves to a surface

Sculpting surfaces, meshing, and troubleshooting

In the second part of the session, making simplified surfaces and sculpting techniques will be discussed. The last part of the session will cover the following concepts:

- Surface analysis
- Introduction to blocks
- Troubleshooting
- Meshing techniques

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Rendering

In the last session we will discuss rendering with both of the internal rendering application Rhino Render and the Flamingo plug-in.

The following concepts will be discussed:

- Lighting
- Making and editing materials
- Adding decals and textures
- Adjusting colors, transparency, and ambient light
- Special effects