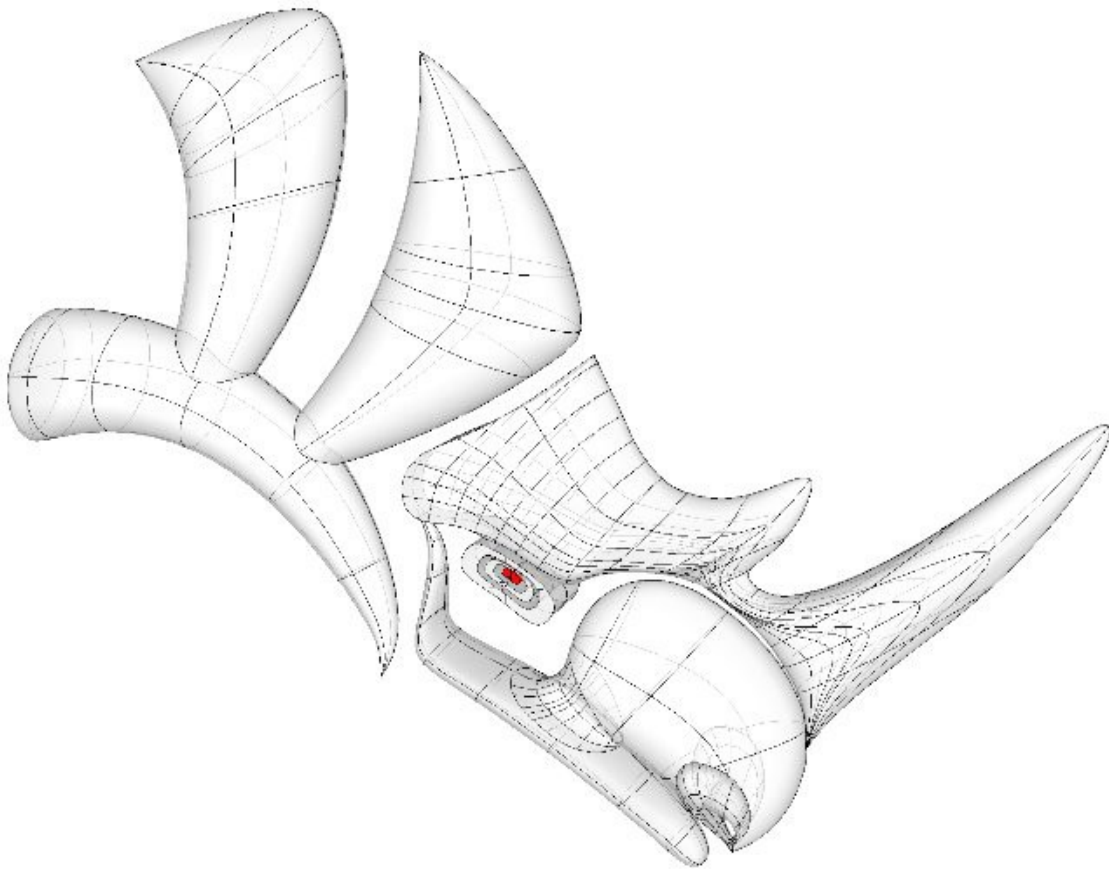


Rhinoceros®

NURBS modeling for Windows



3DTechnics

Rhino Level 1 Two-Day Intensive Course Curriculum

Level 1: Nurbs modeling with Rhino

Course Outline

- In this comprehensive 2-day class you'll learn to create and edit accurate free-form 3D NURBS models. This fast-moving class covers most of Rhino's functionality, including the most advanced surfacing commands

Structure

- In this class, you will systematically move through the user interface, command access, creation and editing curves, surfaces and solids. Information will be presented at an accelerated pace.

Expected Outcomes

- After this course the student is expected to be able to:
 - Move comfortably around the Rhino modeling window
 - Identify when free form or precision modeling is required
 - Create and edit curves, surfaces, and solids
 - Use modeling aids for accuracy
 - Produce simple renderings of the Rhino models

Target Audience

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

Prerequisites

- Windows skills and a desire to model are helpful. Previous drafting and modeling experience is also an asset, but not required.

Curriculum

Day 1: Foundation

- After a brief introduction, the following concepts will be covered:
 - Get acquainted with the Rhino screen and menus
 - Navigate around the Rhino model
 - Create 2-D lines, polylines, and NURBS curves
 - Modeling setup and mode functions: ortho, grip, snap, and planar
 - Fast 3-D solids and surfaces
 - The Rhino layering system
 - Delete objects



Day 1: Precision Modeling

- Use coordinates and constraints to model easily and accurately. Move off the x-y plane and use viewports to establish the current construction plane. Draw polygons and ellipses. Draw free-form curves and compare interpolated and control points curves.
 - Draw with absolute, relative rectangular, and polar coordinates
 - Distance and angle constraints
 - Viewports and construction planes
 - Model in 3-D space, Elevator mode
 - Rectangle command and it's options
 - Point selection with object snaps
 - Analysis commands: length, distance, angle, radius
 - Draw circles, arcs, ellipses, and polygon curves
 - Rhino render and render color
 - Model free-form curves
 - Create helix and spiral curves

Day 1: Extended work on Curves, Display, and Editing

- Learn display commands used to view different model parts. Use edit commands to produce complex and detailed curve variations. Loft and extrude curves into surfaces and solids.
 - Pan, zoom, and reset model views
 - OpenGL shade
 - Edit curves with fillet and chamfer, Loft and extrude curves
 - General editing, move, copy, rotate, mirror, scale
 - Array polar and rectangular
 - Boolean union, difference, and intersection
 - Offset curves and surfaces, Trim and split for curves and surfaces
 - Extend and extend-to-surface

Day 2: Intermediate Edit and Surfacing Commands

- Learn additional editing commands and use them to build practice models. Reinforce concepts of model setup and drawing accurate 2-D geometry to build precision 3-D shapes.
 - Introduction to NURBS modeling concepts and terminology
 - Free-form curves, Control point editing of curves and surfaces
 - Rebuild curves and surfaces
 - Use the nudge modeling aid
 - Create deformable shapes
 - Curve creation through projection
 - Split surfaces with curves and surfaces, Blend between two surfaces
 - Lighting and rendering



Day 2: Advanced Surfacing and Solids

- Learn how to model with solids and solid text. Use Booleans to shape your model. Extrude, loft, and revolve curves into surfaces. Use sweeps to create surfaces. Use advanced surfacing techniques like blend, match, and surface from network of curves.
 - Create solid primitives and solid text
 - Model with pipe and extrude
 - Modifying solids with Booleans
 - Extrude and loft surfaces
 - Revolve curves into surfaces
 - Sweep 1 and 2 rail curves
 - Surface with network of curves

Day 2: Final Modeling

- Reinforce the commands and skills gained in the class by creating several models. Add texture, bump and materials to the Rhino model for rendering. Annotate the Rhino model by adding dimensions. Work with the Options dialog box to refine the Rhino modeling environment. Generate 2-D views of a model for detailing and exporting. Output wireframe images directly to printers and plotters for Rhino.
 - Setup the hammer model
 - Create the hammer construction lines with precision
 - Build the hammer surfaces
 - Render the hammer
 - Import and export models
 - Generate 2-D drawings from 3-D model and export
 - Print wireframe views of the model
 - Edit and create new toolbars and tool buttons for Rhino

