

Lesson 5 – Rhino, Additional Topics

Sub-D (Subdivision Surfaces) – “Continuos Surfaces »

Creating

Primitives – Box, Sphere, etc...

From curves – Extrude, Sweep, Revolve, etc...

From object – Surfaces (or Meshes)

Selecting (sub-objects) – Edges or faces

Single - “Shift + Ctrl + Left-click”

Boundary - “Shift + Ctrl + Double Left-click”

Modifying

Edges

Insert

Slide (“edit tools”)

Creases (“edit tools”) – Sharp edge

Crease – converts a smooth edge to a sharp edge

Remove Crease – Smooths a sharp edge

Faces

Bridge – Similar to “blend surface”

Fill – Covers an open boundary

Subdivide

Mesh - Triangles

Primitives ("Mesh/Polygon Mesh Primitives/..") - Plane, Box, etc...

From NURBS Object ("Mesh") - Creates mesh from surface or solid

Options – More polygons = more triangles

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Importing

Import – Incoming file's 0,0,0 = Rhino's 0,0,0

Insert – Incoming file's 0,0,0 becomes insertion point

“Block Instance”

“As Group”

“Individual Objects”

Formats:

3DM – Rhino files (Rhino = Rhino)

3dsMAX – Use FBX (Motionbuilder)

NURBS objects = Surfaces & Curves

All others = Meshes (no shapes)

FBX 2019 or earlier

Up axis = Z (Preset - Advanced Options/Axis Conversion)

DWG (Format 2018 or earlier) – Layers intact.

Solids = Polysurfaces

Faces = Meshes

Lines = Curves

Polylines = Polycurves

SKP (Version 2018 or earlier). Layers.

“Trimmed Planes”=Polysurfaces. Mesh Objects.

3DS – All Meshes (2D & 3D). Geometry only. No Layers.

Ai (Version CC or earlier) – Imports curves. Planar (2D)

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Output - 3D Printing

CoAD Computer Lab

Export as STL file (also 3DS Max, or other 3D programs)

Need to install the “PrusaSlicer” application & CoAD configuration file

Check on the CoAD Students “Teams” page.

Media – **PLA** (biodegradable)

Size limited to printer size (Prusa i3 MK3S, 8”x8”x10”)

Time-consuming (8+ hours).

No orientation required. Printing managed by lab assistants, not students

College of Natural Science (mynsmstore.uh.edu) – 127 Lamar Fleming Bldg

Numerous 3D printing and Scanning services.

Output - Export (to):

Selected - Base point = World 0,0,0

Export with origin - Choose base point

Revit (3DM , also SAT) - Import as a mass. Can be linked in

AutoCAD (DWG) – Meshes. Choose “Solids”, otherwise file will be linework.

Sketchup (SKP) – Meshes.

Adobe Illustrator (AI) – Will export 2D line work from orthographic views.

Can define scale in Rhino for use in Illustrator (i.e. 1/8” = 1’)

3DS MAX

Motionbuilder (FBX)

“NURBS” option = Both surfaces and curves import as NURBS

“Mesh” option = Cleaner geometry

Objects on the same layer will be linked to a dummy (helper).

Each surface & curve will be a separate object.

Can “Link” using Revit. 3DM -> Revit -> RVT -> 3ds MAX