

Agenda

0. NURBS vs MESH

1. Interface

- Display Area / Wireframe vs Render vs Shaded
- Main Toolbars
- Command Prompt / Repeat Command
- Tools, options, units, grid
- CPlanes

3. Layers and Osnaps / Properties, Details, Object Selection

4. Curve Degree, Rebuild, Dir, Curve Extrusion

5. Copy, Move, Rotate, Rotate 3d, Scale, Scale 1D and 2D, Mirror, Array, Polar Array

6. Solids and Boolean Operations

7. Trim, Split, Extend, Join, Group, Explode, Divide

8. Set views & viewport properties.

9. Dot vs Text

10. History

PART I. Cube Substraction Introduction

This assignment will center on the development of a design exercise that transforms a cube through a series of subtractive operations in the 3D modeling application, Rhino, in order to maintain its basic “cube-ness” while transforming its interior volume into a ‘spatial experience’; in other words something you might see yourself inhabiting.

Guidelines

You are to produce a minimum of one study wherein a series of objects are “carved away” from a 10” cube via Boolean difference operations. Each study must demonstrate a methodical process by showing each and every step spaced at even increments in your Rhino file. Each step should be labeled with a Rhino dot object to explain what command is being used. The objects must be organized on the appropriate layers, sorted by object type. These layers should be nested within layers that correspond with each study. This will make it easy to hide and show various aspects of your studies.

The following strategies must be utilized:

01. Use of **OSnap** to place objects (end snap, mid snap, point snap, etc.)
02. Use of **Group/Ungroup** to organize objects (also try Lock/Unlock and Hide/ Show)
03. Primitive creation with **Box, Sphere, Ellipsoid, Torus**, etc.
04. Basic transformations with **Move** and **Copy**
05. Subtracting solids using **Trim, Split, Boolean Difference, Boolean Intersection**, etc.
06. Dividing edges and curves with **Divide**

07. Reflecting objects across a plane using **Mirror**
08. **Rotate** and **Rotate 3D** with and without making a copy
09. Finding centers with **AreaCentroid** and **VolumeCentroid**
10. Non-uniform scaling with **Scale1D** and **Scale2D** and uniform scaling with **Scale**
11. Advanced transformation-copies with **Array** and **Polar Array**

Checklist

1. Is the file named properly?
2. Is your box a 10 inch cube placed at the origin of the XY plane?
3. Did you demonstrate process by maintaining every step in each study, evenly spaced?
4. Is each step labeled with a Rhino dot to explain what command is being used?
5. Are all objects on the correct layer and does the file exhibit good layer management?
6. Were all of the outlined strategies and commands used at least once?
7. Are your final objects in each study closed poly-surfaces?

PART II. Bustling Vacancy_ Alphabet

Following the same strategies as the cube subtraction study work with your group to produce **12 studies that composition-wise relate to the architectural elements creation of the integration project (as discussed in class): Stair, Atrium, Partition.** Produce 4 studies per element.

Tutorials & Architectural references

Uploaded on blackboard under the folder *Tutorials*.

- Rhino Tutorial,
- Basics-Rhino Video Tutorials,
- Rhino_Boolean Operations 1 and 2 **SOS**

Take a look on the architectural inspiration uploaded on blackboard under the folder:

- Content / *References* the ones that refer to Boolean Operations.
- Content / Integration Project_ Bustling Vacancy/ Architectural Elements References.

You can also take a quick look at results from previous semester (do get influenced from these):
PLB_Education

Submission

Due Date: 2.00 pm Friday, February 14th.

Please upload on blackboard, your Rhino files **named accordingly**:

Individually:

01. A rhino file with 1 study following the video tutorials on Boolean Operations (1&2)
- As a group** ((one of the group members uploads. Do not upload the same files 2 times):
02. A rhino file with 4 studies of Atrium studies.
03. A rhino file with 4 studies of Stair studies.
04. A rhino file with 4 studies of Wall studies.