



**Visual Studies I: Arch 1191**

**Assignment Number:** 9

**Computer Program(s):** McNeel Rhinoceros Cont'd

**Student Learning Objectives:**

*Upon successful completion of this assignment, the student will:*

1. Understand how to model in 3D a simple geometric object in McNeel Rhinoceros (Rhino).
2. Know how create a Rhino model file.
3. Know how to toggle between the four standard view points.
4. Know how to set up units.
5. Know how to set up a grid.
6. Know how to use the solid tools palette.
7. Know how to use Boolean operations (addition, subtraction) in order to create more complex forms.
8. Know how to use more complex modeling tools: surfaces, meshes, etc.

**Assessment:**

*To evaluate the student's achievement of the learning objectives, the professor will do the following:*

1. Evaluate the student's understanding McNeel Rhinoceros by examining both the digital file and the hard copy output.

**Project Description:**

In this assignment, you will model in three dimensions digitally your assignment 9 from Arch 1110, Extruded Geometries.

**Process:**

1. Create a new file in Rhino.
2. Choose units, inches and match units with Distance Display.
3. Choose grid tab, and set grid snap and grid spacing: a grid of 8 is best when working in inches.
4. Choose one view port to begin your drawing.
5. Draw the 48' square that is the limits of your drawing.
6. Reconstruct your chosen square design in Rhino, Autocad, or import a raster of your design and trace over it.
7. Create the solids as defined by the rules of shape generation:
  - a. At point/intersections, create a column, either a 2 foot diameter cylinder or a 2 foot square prism centered on the point/intersection.
  - b. At single lines, walls are extruded and must be 2 feet wide and centered over the defining line. The length should be one foot more at each end of the line.
  - c. Volumetric elements are defined by some combination of lines, both straight and curved, that enclose an area.
8. Use Boolean Operations to create volumetric elements:
  - a. Volumetric elements are defined by some combination of lines, both straight and curved, that enclose an area.
  - b. Positive volumes are defined by extending one foot past the defining lines.
  - c. Negative volumes are defined by extending one foot inside the defining lines.
  - d. Maximum height of any positive element is 24 feet above grade.

- e. Negative volumes may not extend more than 4 feet below grade.
  - f. All vertical dimensions must be in one foot increments.
  - g. The tops and bottoms of all extruded elements must be flat horizontal surfaces.
  - h. Create a minimum of two cases of intersecting elements of different heights.
  - i. See additional rules in Arch 1110's Assignment 9.
9. Complete three dimensional model of Extruded Geometries design.
  10. Create page layout for printing:
    - a. Select view>Page Layout>New Page Layout.
    - b. Choose printer.
    - c. Choose page size: 11x17.
    - d. Choose orientation.
    - e. Set initial Detail Count to 4, hit OK. Detail count is equal to the number of viewports in Autocad. Note Autocad will automatically create a viewport for each tab.
    - f. Manipulate viewports:
      - i. Double click inside the viewport.
      - ii. Rotate, pan, zoom, and orbit or use the select view icon.
      - iii. Lock chosen view.
      - iv. Shade chosen view.
      - v. Choose background color.
  11. Render your composition:
    - a. Set the renderer to Rhino renderer.
    - b. Choose resolution
    - c. Background color
  12. Export images: screen capture or export file type.
  13. Import images into Adobe Illustrator.
  14. Format images with title block.
  15. Print hard copy. What are the differences between working in three dimensions by hand and working digitally? Pros and cons of each?