RhinoCAM General Info

Opening RhinoCAM- select **Mill** from menu.

Programming Workflow- use **Machining Browser** (**MOps**) dialogue box

1) **Program** Tab- **Machine Setup**, and defining **Stock**
   A) **Machine**
      i) Select "Manual Definition."
      ii) Machine Type: Number of Axes- select 3 Axis
   B) **Post**- select "TechnoIsel" from current post processor menu.
   C) **Stock**- "Box Stock" is most common selection.
      i) Draw a rectangle in X & Y planes to form perimeter of stock.
   D) **Align**
      i) Align Stock and Part- dependent upon location of object within workpiece for Z alignment, and XY alignment.
      ii) Set World C.S.
         a) Set WCS Origin- select "set to stock box"
         b) Zero Face- select "highest Z"
         c) Zero Position- select "South West"
2) **Program** Tab**-** creating **Machine Operations** (2 & 3 Axis)
   A) **Tool**- download cutting tool library from Architecture's homepage: Student Groups & Resources > Woodshop/Digital Fabrication Shop (view resources) > RhinoCAM Tool Library
      i) Select Compression Cut cutter (1/4" or ½") when cutting plywood in order to prevent tearing of top and bottom surface.
   B) **Feeds & Speeds**
      ii) Default feeds and speeds are preset for the cutters in the downloadable library.
      iii) If using cutters other than those in the library, use the following default settings:
         a) Spindle Parameters- 18,000 RPM (1/4" tooling and smaller), 9,000 RPM (1/2" tooling)
         b) Feed Rates (in/min)- Plunge= 30; Approach= 200; Engage= 200; Cut= 250; Retract= 30; Departure= 200
      iv) Actual feeds and speeds will be set at time of milling using milling calculator (only on computer in rm 109). Defaults allow for estimate of milling time.
   C) **Cut Parameters**
      i) Cut Direction- when cutting plywood, select "Climb (down cut)" to prevent tear out of surface.
   D) **Cut Levels**
      i) Rough Depth/Cut- the depth of each individual cutting pass, relative to the total cut depth.
         a) Must be set at no more than half the diameter of the cutter (ie. ½" cutter- rough depth/cut= ¼"). Foam can be cut to a depth of the full flute length (view individual tools for specifications)
   E) **Advanced Cut Parameters**
      i) Bridges/Tabs- must be made to prevent workpiece from being thrown when cutting is complete (check Create Bridges box)
         a) Positioning of automatic bridge/tabs is determined by selecting either the number of bridges, or the distance between bridges.

ii) Manual bridge points- allows for specific positioning of individual bridge points (creation of manual bridge points must be completed in specific order)
    a) Create machining region set (in **Machining Objects Browser**)
    b) Create machining operation (2 Axis operations)
        i) Control Geometry > Select Pre-Defined > select machine region set
        ii) Advanced Cut Parameters > Bridge/Tabs > check box and size tabs, and select either number of bridges or distance between bridges.
        iii) Generate file > then Simulate.
    c) Select Manual Bridge Points on Selection (in **Machining Objects Browser**) > select points
    d) Regenerate file (right click on file for menu options) > then Simulate

F) Right-clicking on MObs file
    i) Information- gives estimate of cutting time

Programming Workflow- use **Machining Objects** (MOps) browser dialogue box

1) **Tools** tab
    A) View individual cutters in library for specifications, and feeds and speeds
2) **Regions** tab
    A) Regions are individual or groups of curves combined to determine cutting paths
        i) Best practice is to pre-select curves using Curve > Curve From Object > Duplicate (Edge/Border/Face Border/Mesh Edge)