Surfaces in Orthographic

ENGR 1182
Graphics 04
Today’s Objectives

- Drawing Complex Surfaces in Orthographic
  - Inclined
  - Curved
- Points, Edges, and Surfaces in Multiple Views
  - Tracking
- GP04 In-Class Activity
- GP04 Out-of-Class Homework Assignment
Complex Surfaces in Orthographic
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Inclines in Orthographic

- In orthographic projection, inclined surfaces are defined by the view in which they appear as an edge.
- They are shown as an edge in one view, and as a surface in the other two views.
- The true length is given by the line, the shape is given by the two other views.
Inclined Surfaces: Example

* Note that the edges of the inclined surface project orthographically into the other two views.

* Note that the size of the inclined surface changes in two views, but the shape does not.
Curved Features in Orthographic

- Curved surfaces are similarly described in orthographic.
- Curved features appear as a curved edge in one view, as a surface in the other two views.
Centerlines and Centermarks

- Centerlines and centermarks are used to show the center of a circular or cylindrical feature.
Centerlines and Centermarks

- Centerlines and centermarks are used where the arc of a surface is $\geq 180^\circ$
- Centerlines are drawn through the length of the center of a cylinder or circular hole
- Centerlines are shown as alternating long and short dashes
- Both centerlines and centermarks extend past the edges of the circular feature
Line Precedence

- **Visible lines** takes precedence over all other lines

- **Hidden lines** take precedence over center lines

- **Center lines** have lowest precedence

• In this drawing, a visible line overlies a centermark.

• Notice that the extension lines from the centermark are still visible.
In-Class Activity (GP04)
Point, Edge, and Surface Tracking
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Points in Orthographic Projection

- In orthographic views, the projected points of an object will be aligned between views.
Edges in Orthographic Projection

- Edges are defined by two or more points, and also project orthographically between views.
- Sometimes an edge may appear to be a point, when you are looking directly down the line.
Surfaces in Orthographic Projection

- Surfaces are defined by 3 or more points, also project orthographically between views.
- Sometimes surfaces may appear as a line when you look directly down the edge of that surface.
In-Class Activity (GP04)
Important Takeaways

- Inclined and curved features are shown as an edge in one view, and as planes in the other two views.
- Centerlines and centermarks are used to show the center of circular or cylindrical features.
- Points, edges, and surfaces project orthographically between views.
What’s Next?

- Due Next Class: GP04 Out-of-Class

- Missing Lines
  - Using multiple views to identify and add in missing lines, centerlines, and centermarks

- Missing Views
  - Using information from two views to create the missing third view
  - Using all three views to create the missing isometric view

- Take Graphics 5 Quiz on readings