Graphics 2: Isometric Sketching From Different View Points

ENGR 1182
Today’s Learning Objectives

- Continue to use coded plans to draw isometric sketches of objects
- Improve visualization skills by drawing objects from different corner views
Coded Plans and Corner Views

Each corner of a coded plan is labeled as if from above, or from a “bird’s eye view”.

Objects can be drawn and viewed from different corners to show details.
Isometric Corner Views

Though your view point changes, the object remains unchanged.

“Bird’s eye view” of the coded plan

SW Image for Corner - SOLIDWORKS Part (see EEIC website)
In-Class Assignment (1 of 2)

Example:

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INDICATE THE CODED PLAN CORNER VIEW FOR THE CORRESPONDING ISOMETRIC VIEW ON THE RIGHT

DRAW THE CORRECT ISOMETRIC SKETCH OF EACH OBJECT AS DEFINED BY ITS CODED PLAN
Graphics 2: Inclined and Curved Surfaces in Isometric Sketching

ENGR 1182
Today’s Learning Objectives

- Incorporate inclined planes and curved features into isometric sketches
- Draw holes and determine visibility of backs of holes
Inclined Surfaces

Inclined surfaces are angled with respect to vertical or horizontal planes (normal planes).

Inclined surfaces can occur in any orientation on an object.
Drawing Inclined Surfaces

- First, draw the surfaces that are not inclines.
- Then, draw the lines to connect the corners of the inclined plane.
Curved Features

Recall that in isometric sketches, squares and rectangles become parallelograms.

Similarly, circles appear as ellipses in isometric sketches.
Drawing Curved Features in Isometric

Start by drawing a bounding box

Draw tic marks at the midpoints of the box

Sketch in the two long arcs, followed by the two short arcs of the ellipse

To see how this is done, run the animation video found on the website in "Before Class" Item 4. "Ellipse on Cube"
Curved Surfaces in Isometric

- The most common curved feature in isometric sketches are holes.

- Some holes go completely through an object
  - “Through hole” as shown below

- Others only go partially through an object
  - “Blind hole”
Drawing Circular Holes in Isometric

For objects that are relatively thin, it is common to see the bottom of the hole in an isometric sketch

To determine if the back of a hole is visible, lightly sketch the bounding box for the back circle

If part of the box lies within the front circle, darken that part of the arc.

To see how this is done, run the animation video found on the website in "Before Class" Item 4. "Hole through Cube"
Drawing Ellipses in Isometric *(the $\frac{3}{4}$ trick)*

1. Draw parallelogram to size the ellipse
2. Draw diagonals to locate center point
3. Draw bisector lines (dashed) through center point to establish tangent points
4. Erase all construction lines leaving only the ellipse

See optional Hand Drawing an Ellipse on the EEIC website
In-Class Assignment (2 of 2)

DRAW AN ISOMETRIC SKETCH OF THE OBJECT FROM THE VIEWPOINT OF THE GIVEN CORNER
Important Takeaways

- Changing the view point does not change the object, just shows different details
- Inclined surfaces are angled with respect to normal planes
- Circles and circular holes are drawn as ellipses in isometric
Preview of Next Class

- **Orthographic Projection Basics**
  - Representing isometric sketches with a set of related 2D sketches

- **Hidden Lines**
  - Integrating details of hidden features in orthographic drawings