Slide Set 2 – Drawing Views and Orthographic Projection I – Third Angle Projection
Projections

• Behind every 2D drawing of an object is a **space relationship** involving the object and three “imagined” things:
  – The observer’s eye, or station point
  – The plane of projection
  – The projectors (also called visual rays or lines of sight)
Projections

Parallel Projection

Perspective Projection

Parallel Projection (why?)
Projections

What type of vision is “real life” (imagine looking at a long rectangular box)?
HW 1 Problem 1 – find an example of a three-point perspective drawing/photo from the web
Projections

primarily concerned with these in this course
Projections

- Perspective projection
  - Linear perspective
    - One-point perspective
  - Aerial perspective
    - Aerial perspective
- Parallel projection
  - Oblique projection
    - Cabinet projection
  - Orthographic projection
    - Axonometric projection
      - Isometric projection
    - Multiview projection
      - First-angle projection
      - Second-angle projection
      - Third-angle projection
      - Fourth-angle projection
  - Dimetric projection
  - Trimetric projection
Projections

(a) Multiview projection

(b) Axonometric projection (isometric shown)
Orthographic Projection

Drawing Views – General

• How many views are utilized in a drawing?
  – First use the six principal Orthographic views
What happens if you unhinge and unfold the faces of the box around the front panel?
Third Angle Projection (USA)
First Angle Projection (Europe, Asia)
Third Angle Projection

Left edge of the FRONT view is aligned to the Left edge of the TOP view.

Bottom edge of the FRONT view is aligned to the Bottom edge of the RIGHT view.
Height, Width and Depth Dimensions
Types of surfaces

5.37 Normal Surfaces

5.38 Inclined Surface

5.39 Oblique Surface
Projection of flat (normal) surfaces

Normal surfaces always appear as their **true size** in each view.

Before doing some practice, some **general** points about drawing...
Freehand Drawing

- In freehand, it is acceptable to not use special pencils or precisely follow the line weight rules.
- However, use the following as a guide:
Exercise 1

Draw the third angle front/top/right views for the following object (hash marks are spaced ¼ inch apart):
What would the front and top view of this structure look like?
Exercise 2

Look at the top view below and draw an object it could represent (I’ll do one for you)

A | B | C
---|---|---
A  |   | C

Top view
Types of surfaces

5.37 Normal Surfaces

5.38 Inclined Surface

5.39 Oblique Surface
Projection of inclined surfaces

Inclined lines and surfaces are **foreshortened** on planes to which they are inclined.
Exercise 3

Draw the third angle front/top/right views for the following object (hash marks are spaced 1/4 inch apart):
Alphabet of lines

- **Centerlines**: Centerlines are thin, long and short dashes, alternately and evenly spaced, with long dashes placed at each end of line.
- Centerlines are used to represent the axes of symmetrical parts of features, bolt circles, paths of motion, and pitch circles.
- Every circle, and some arcs, should have two centerlines that intersect at their center of the short dashes – this is the centermark.
Exercise 4

Draw the third angle front/top/right views for the following object (hash marks are spaced $\frac{1}{4}$ inch apart):

![Diagram of an object with hash marks spaced $\frac{1}{2}$ inch apart and a circular cutout.]}
Exercise 5

Draw the third angle front/top/right views for the following object:
Types of surfaces

- Normal Surfaces
- Inclined Surface
- Oblique Surface
Projection of oblique surfaces

- Oblique surfaces:
  - Cannot appear as an edge in a standard view (not perpendicular to any standard plane)
  - Will not appear as true size in any view
Exercise 6

Draw the third angle front/top/right views for the following object (hash marks are $\frac{1}{4}$ inch):
Exercise 7

Fill in the missing lines:
Exercise 8

Fill in the missing lines:
Exercise 9

Draw the missing (RIGHT) view:
Exercise 10

Draw the missing (TOP) view:
On your own...

- In addition to HW 1-1, try exercises 7 – 11 in Chapter 2 of the Planchard text

Exercise 9:

Identify the surfaces with the appropriate letter that will appear in the FRONT view, TOP view and RIGHT view.

FRONT view surfaces: ________________

TOP view surfaces: ________________

RIGHT view surfaces: ________________
Project Examples