

## Understanding First Angle Projection and Third Angle Projection

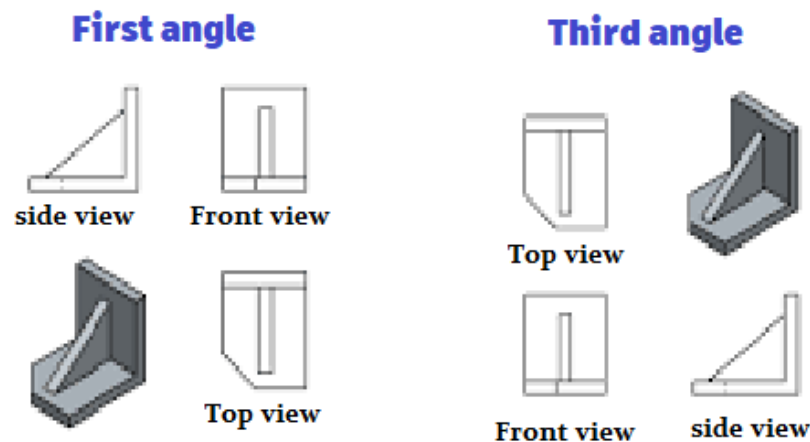
Orthographic projection is a key part of **Engineering Graphics** because it allows engineers to represent a 3D object accurately on 2D paper. There are two main conventions used worldwide: **First Angle Projection** and **Third Angle Projection**. Though they serve the same purpose, they follow different rules of view placement.

This guide will take you step by step through **how to create both projections correctly**.

Courtesy of FUTOGIST, DNA

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### VIEWS PLACEMENT FOR FIRST ANGLE AND THIRD ANGLE



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## 1. First Angle Projection

### Step 1: Understand the Principle

In First Angle Projection, the object is imagined to be placed **in the first quadrant** – that is, **in front of the vertical plane (VP) and above the horizontal plane (HP)**.

The planes are then unfolded to give a 2D layout of views.

**Key rule:**

- **Top view is placed below the front view.**
  - **Right side view is placed to the left of the front view.**
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## **Step 2: Choose a Simple Object**

Take a simple object like a rectangular block with a hole. Decide which face will be treated as the **front view**.

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## **Step 3: Draw the Front View**

- Draw the **front view** on the vertical plane.
  - This view shows the **height and length** of the object.
  - Use correct dimensions, line weights, and centerlines where needed.
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## **Step 4: Project the Top View**

- Drop **projectors (thin construction lines)** downward from key points of the front view.
  - Measure **depth** of the object from your data and draw the **top view below** the front view.
  - Make sure all features (holes, notches) line up with the front view.
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## **Step 5: Project the Side View**

- Extend projectors horizontally from the front view to the **left side** (because in First Angle, the side view is placed on the opposite side).
  - Use a 45° miter line if needed to transfer depth from the top view to the side view.
  - Complete the side view with all features correctly represented.
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## **Step 6: Add Dimensions and Title Block**

- Dimension each view properly (avoid overcrowding).
  - Label views: **Front View**, **Top View**, **Left Side View**.
  - Add a title block with the symbol of **First Angle Projection** (standard ISO symbol: truncated cone with base on the left).
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## Step 7: Verify

Check that all three views align correctly. Top view must be vertically aligned, side view horizontally aligned.

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## 2. Third Angle Projection

### Step 1: Understand the Principle

In Third Angle Projection, the object is imagined to be placed **in the third quadrant** – that is, **behind the vertical plane (VP) and below the horizontal plane (HP)**.

The planes are unfolded differently, giving a different layout.

#### Key rule:

- **Top view is placed above the front view.**
  - **Right side view is placed to the right of the front view.**
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### Step 2: Draw the Front View

The front view remains the same as in First Angle. Draw it carefully with correct dimensions.

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### Step 3: Project the Top View

- Project construction lines **upward** from the front view.
- Draw the **top view above** the front view using object depth.
- Ensure holes, cutouts, and features match.

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#### Step 4: Project the Side View

- Extend projectors horizontally from the front view to the **right side** (because in Third Angle, side views are placed on the same side as the object).
- Transfer depth from the top view and complete the side view.

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#### Step 5: Add Dimensions and Title Block

- Dimension the drawing following standards (avoid repetition of dimensions).
- Label views: **Front View, Top View, Right Side View**.
- Add the **Third Angle Projection symbol** (same truncated cone symbol but with base on the right).

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#### Step 6: Compare with First Angle

To check your work, verify:

- In First Angle, top view is **below**, side view is **opposite side**.
- In Third Angle, top view is **above**, side view is **same side**.  
If your placement matches, you have drawn it correctly.

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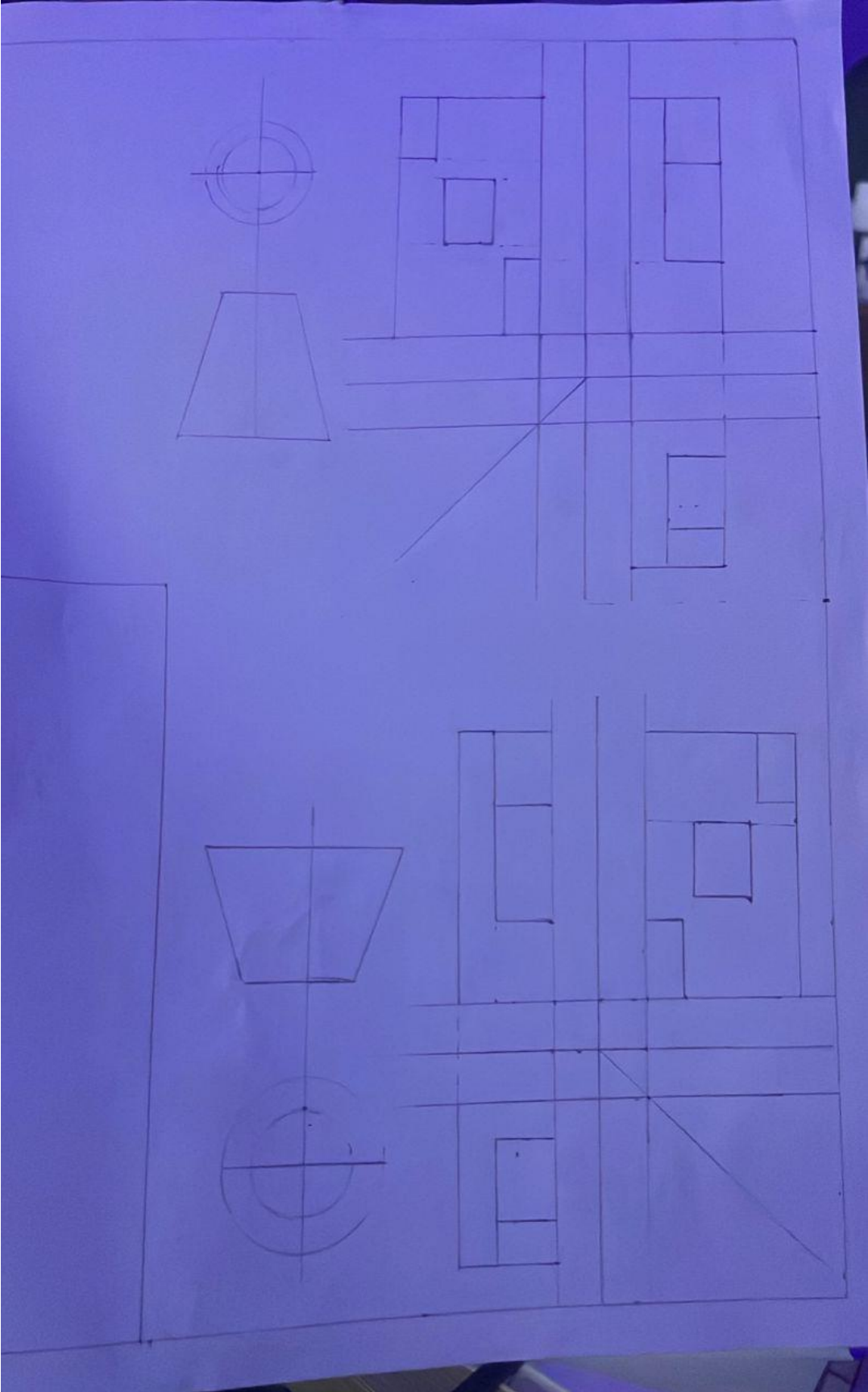
#### Tips for Success

- Always use **light construction lines** first, then darken visible edges.
  - Hidden lines must be drawn as **dashed lines**.
  - Keep all views perfectly aligned misalignment is a common mistake.
  - Use proper line weights: thick for visible edges, thin for construction and projection lines.
  - Add centerlines for symmetry and holes.
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## Summary Table

Feature	First Angle Projection	Third Angle Projection
Quadrant	First (Front + Above)	Third (Behind + Below)
Placement of Top View	Below Front View	Above Front View
Placement of Side View	Opposite side	Same side
Commonly Used In	Europe, Asia, Africa	USA, Canada, Australia
Symbol in Title Block	Base of cone on left	Base of cone on right

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## Conclusion

Mastering both projection methods is essential for every engineering student. **FUTO uses First Angle Projection (ISO Standard)**, so students must be comfortable with this system. However, understanding Third Angle Projection is also valuable, especially when working with international teams or reading foreign manuals.

By following the above steps carefully, you can produce **clear, professional drawings** that communicate your design intent accurately.

Attend our all in one GET masterclass where we will unveil how to pass your GET Exam and fill your manual with ease on the 13th September 2025. At CSC lecture hall at 12pm

