School of Mechanical & Manufacturing Engineering (SMME),

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Assignment # 1

"ORTHOGRAPHIC PROJECTION"

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1. OBJECTIVE

This engineering drawing task focused on grasping the fundamentals of orthographic projection, with a specific emphasis on utilizing the first angle view approach within AutoCAD software. The goal was to develop proficiency in accurately translating three-dimensional objects into two-dimensional representations, enhancing comprehension of projection systems and technical drawing standards.

2. DEFINITIONS

2.1. Orthographic Projection

A fundamental approach utilized in technical drawing to illustrate the three-dimensional structure of an object in two dimensions through the projection of its views onto orthogonal planes.

2.2. First Angle Projection

In this orthographic projection method, the object is situated in the first quadrant of 3D space, and its views are projected onto planes positioned between the object and the observer.

2.3. Third Angle Projection

In this approach to orthographic projection, the object is located within the third quadrant of 3D space, and its views are projected onto planes positioned beyond both the object and the observer.

2.4. Visible Edges

These lines depict the contours and characteristics of the object that are directly observable in the orthographic projections.

2.5. Hidden Edges

Lines delineating features of the object that are obscured from direct view in the provided projections, yet are indispensable for conveying comprehensive information regarding the object's geometry.

2.6. Centre Lines

These lines denote the center of symmetry, rotation, or other prominent characteristics of cylindrical or symmetrical components.
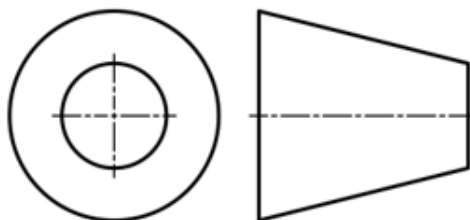
3. PROJECTION SYSTEMS

There are four types of projection systems, out of which the two used in this assignment are listed below:

3.1. First Angle Of Projection

This method of orthographic projection places the object in the first quadrant of 3D space, with its views projected onto planes positioned between the object and the observer.
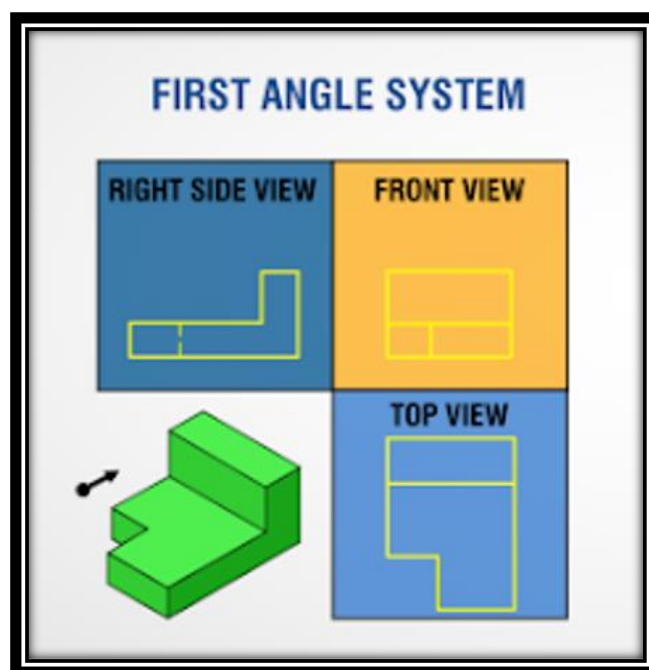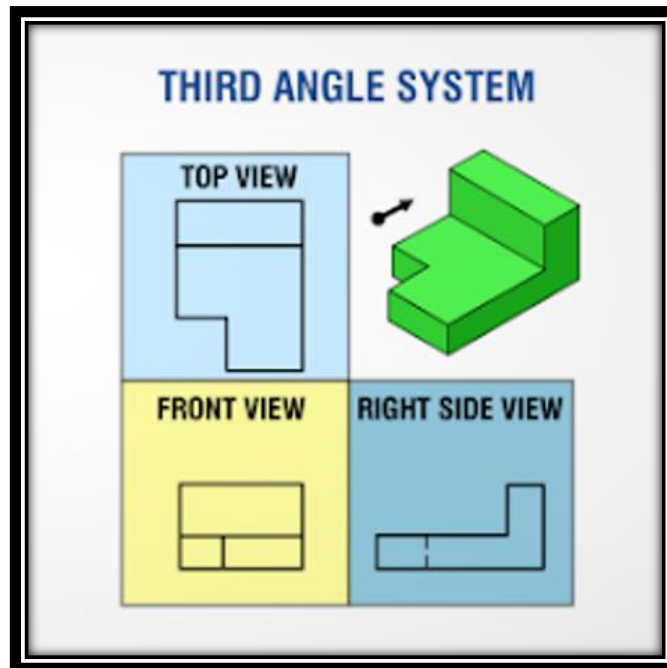

*Fig 3.1.1. – Object in 1ˢᵗ Angle Projection & Orthographic View.*

Fig 3.1.2. – Drafting Standard for 1ˢᵗ Angle Projection.

3.2. Third Angle Of Projection

In contrast, the third angle projection system positions the object in the third quadrant of 3D space, with its views projected onto planes situated beyond the object and the observer.

Fig 3.2.1. – Object in 3ʳᵈ Angle Projection & Orthographic View.
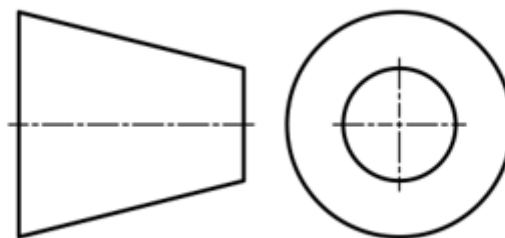
Fig 3.2.2. – Drafting Standard for 3ʳᵈ Angle Projection.

4. USED AutoCAD TOOLS

4.1. Layer

In AutoCAD, layers are used to organize and manage different elements within a drawing. Objects can be assigned to specific layers, allowing for easy control of visibility, color, linetype, and other properties. Layers help maintain clarity and organization in complex drawings.

4.2. Mirror

In AutoCAD, the Mirror command creates a mirrored copy of selected objects, flipping them across a specified line to create a symmetrical reflection.

4.3. Fillet

Fillet is a command in AutoCAD used to create a rounded corner or edge between two intersecting lines or curves. The fillet radius determines the size of the rounded corner.

4.4. Trim

The Trim command in AutoCAD is used to remove portions of lines or objects that intersect with other objects. It essentially "trims" away unwanted parts to create clean intersections.

4.5. Move

The Move command allows users to relocate selected objects to a new position in the drawing area. It enables precise movement of objects by specifying a base point and a destination point.
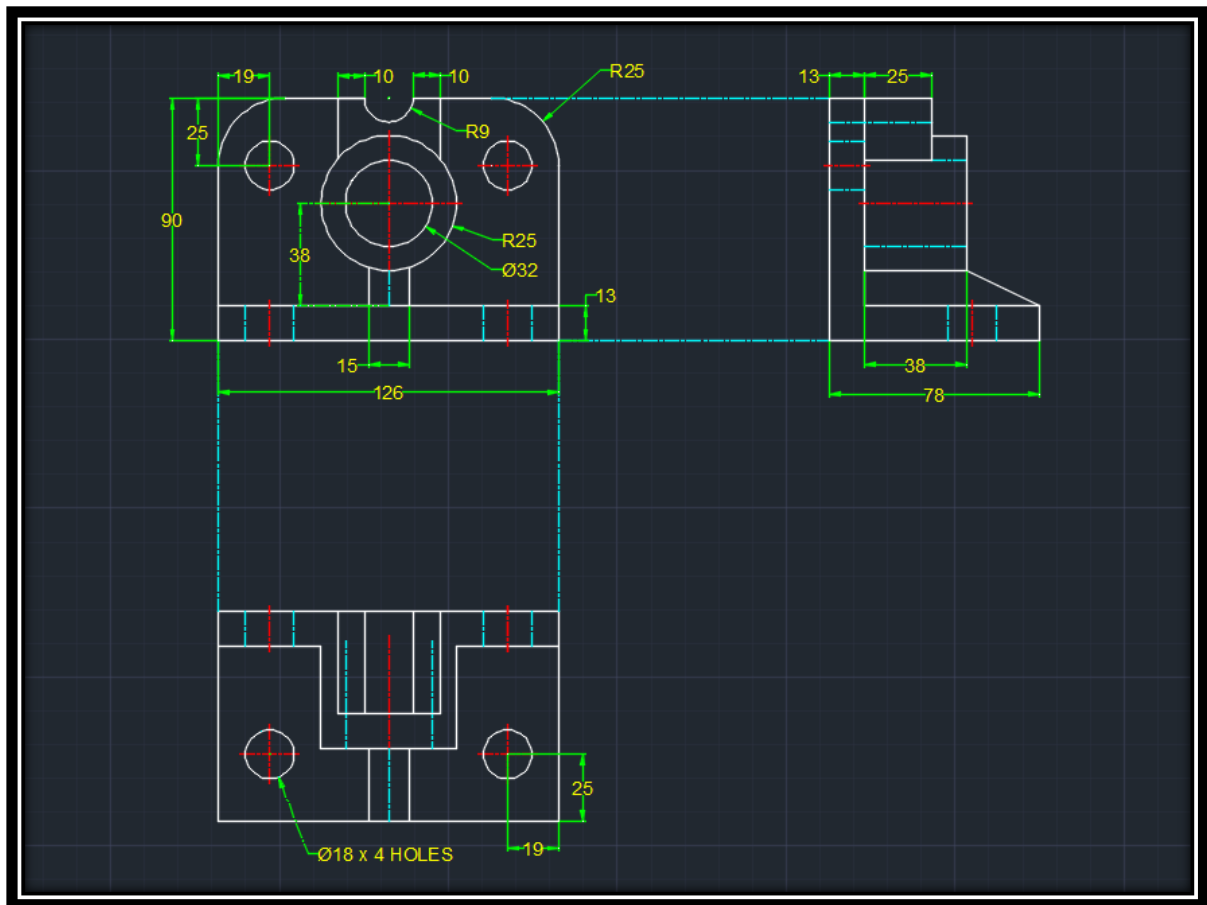
5. DRAWING TASKS

5.1. Task 1
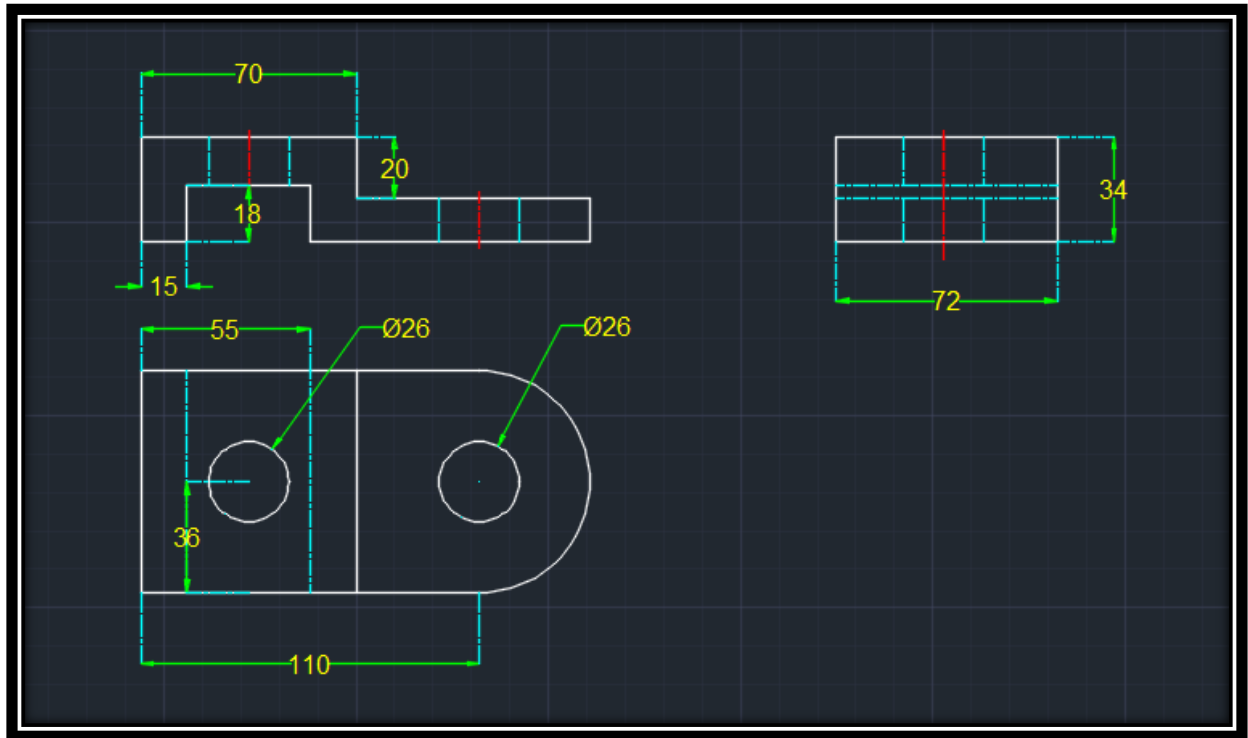
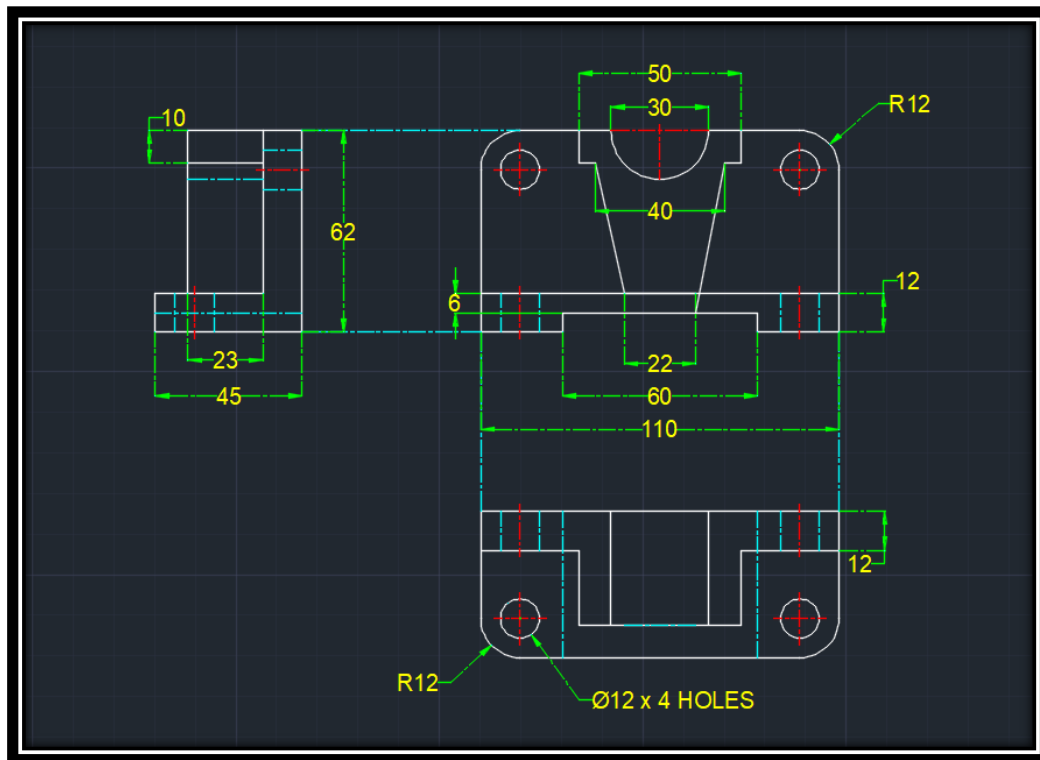*Fig 4.1.1. – Object in 1ˢᵗ Angle Projection & Orthographic View.*

5.2. Task 2

Fig 4.2.1. – Object in 1ˢᵗ Angle Projection & Orthographic View.

5.3. Task 3

Fig 4.2.1. – Object in 3rd Angle Projection & Orthographic View.

6. CONCLUSION

In short, this assignment was all about learning how to draw 3D objects on a computer using AutoCAD. By following specific rules called **1st angle projection** and **3rd angle proection**, we could show these objects accurately in 2D.

We not only got better at using AutoCAD but also understood important concepts like how to draw different views of an object, organize drawings neatly, and work faster without making mistakes.

This assignment helped us become more skilled at using AutoCAD and better at drawing technical designs. It was a valuable learning experience that will help us tackle more complex projects confidently in the future.

The end…