
***School of Mechanical & Manufacturing Engineering (SMME),***

***National University of Science and Technology (NUST),***

***Sector H-12, Islamabad***

Program: BE-Aerospace Section: AE-01

Session: Spring 2024 Semester: 2nd

Course Title: Engineering Drawing AE-103

# *Assignment # 1*

## ***"Orthographic Projection"***

***Name:*** **Muhammad Daniyal Tariq**

***CMS:*** **463001**

## *1.* OBJECTIVE:

This engineering drawing assignment is assigned us to grasp the fundamentals and techniques of orthographic projection, with a specific emphasis on utilizing the first angle view approach within the AutoCAD software. Through this assignment, instructor aimed us to develop proficiency in accurately translating three-dimensional objects into two-dimensional representations.

## 2. DEFINITIONS:

- **Orthographic Projection**

A fundamental technique used in technical drawing to represent the three-dimensional form of an object in two dimensions by projecting its views onto perpendicular planes.

- **First Angle Projection**

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

- **Third Angle Projection**

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

- **Visible Edges**

These lines represent the outlines and features of the object that are directly visible in the orthographic projections.

- **Hidden Edges**

Lines representing features of the object that are obscured from direct view in the given projections but are essential for conveying complete information about the object's geometry.

- **Centre Lines**

These lines indicate the center of symmetry, rotation, or other significant features of cylindrical or symmetrical parts.

## 3. KEY CONCEPTS:

**Projection Systems:**

There are two types of projection systems:

1. **First Angle 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.

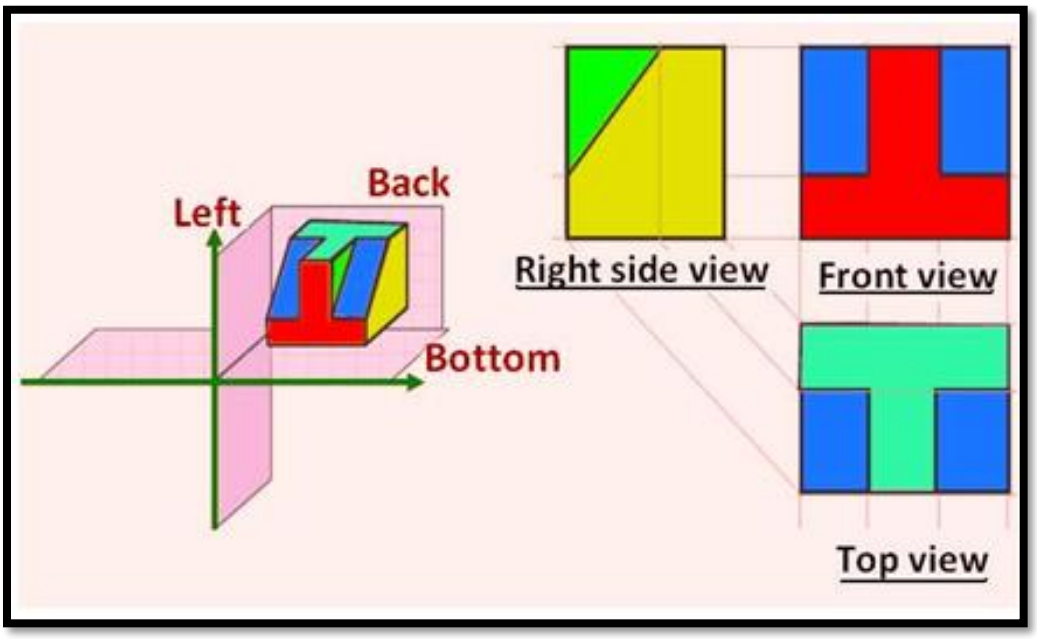



*Fig 1.1 – Object in 1st Angle Projection & Orthographic View.*

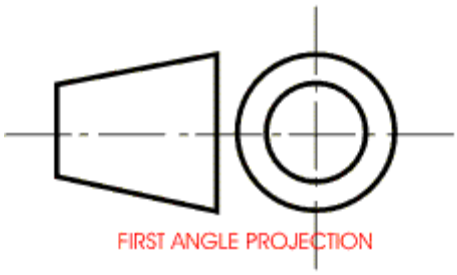



*Fig 1.2 –Drafting Standard for 1st Angle Projection.*

2. **Third Angle 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.

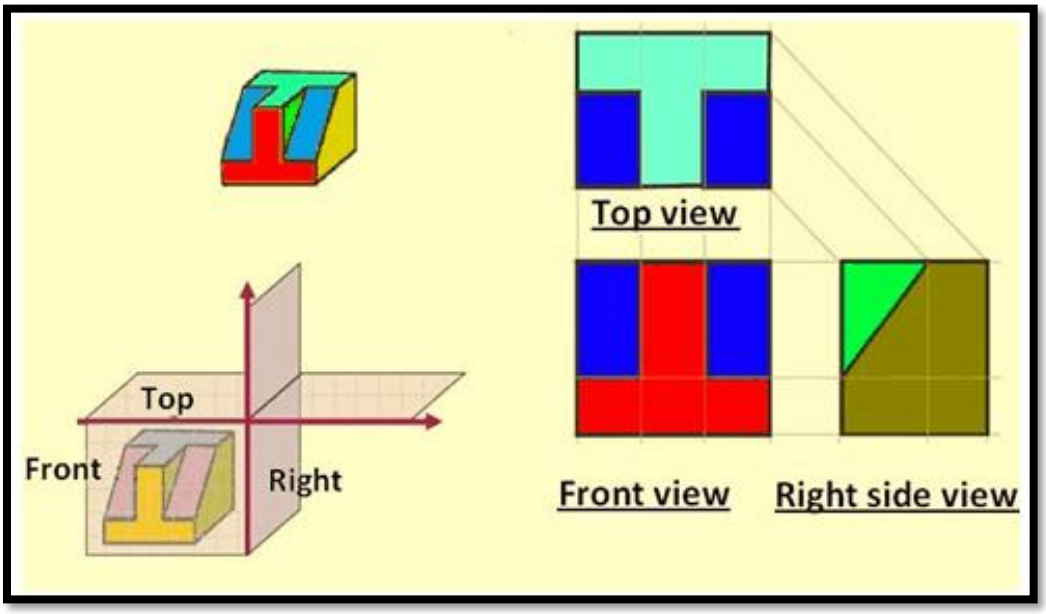



*Fig 1.3 – Object in 3rd Angle Projection & Orthographic View.*

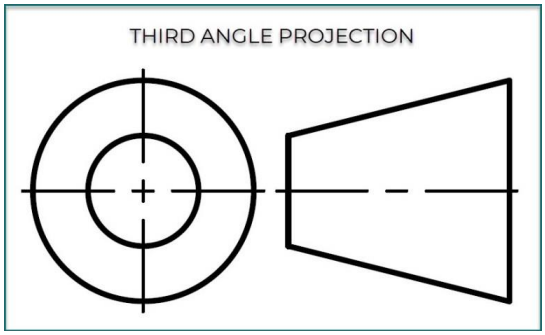



*Fig 1.4 –Drafting Standard for 3rd Angle Projection.*

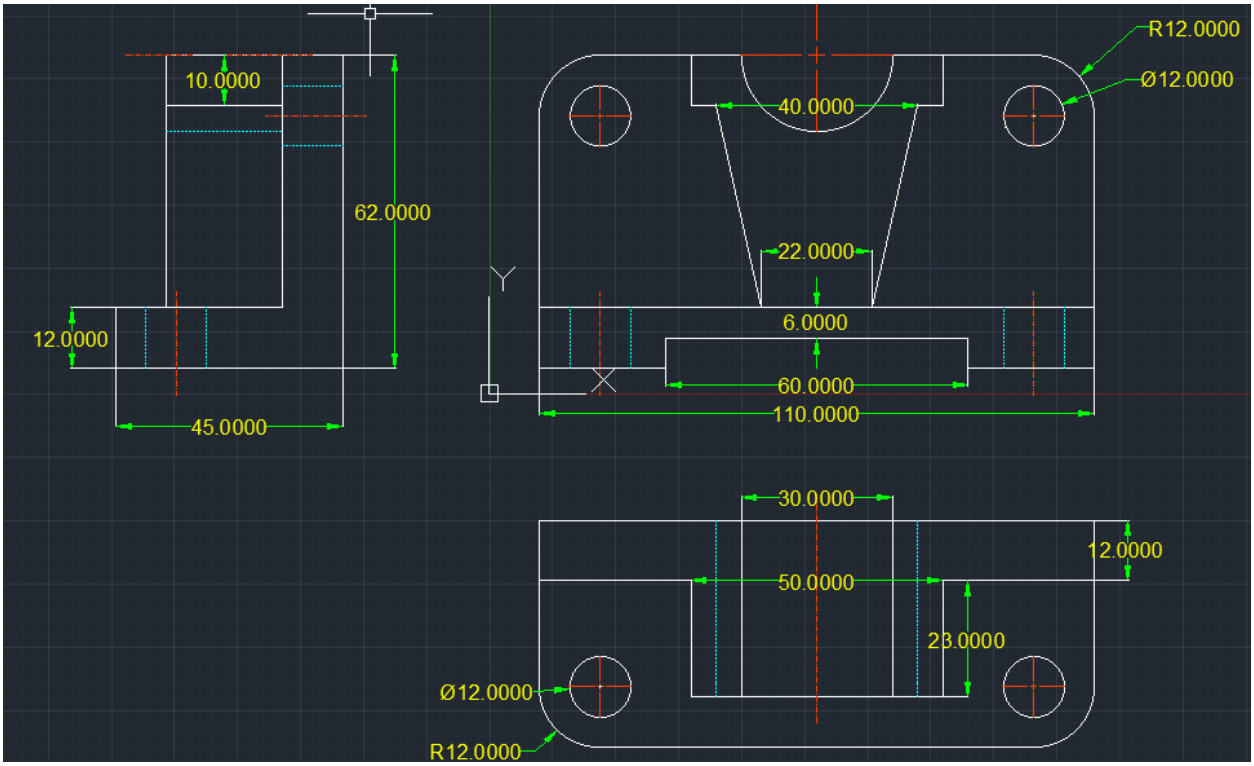
## 4. PROCEDURE:

Following steps were followed in each drawing:

1. **Creating Layout Page:** I created a Layout Page for my drawing on an **A2** Equivalent sheet with a distance of 20mm from the left and 10mm from the rest of the sides.

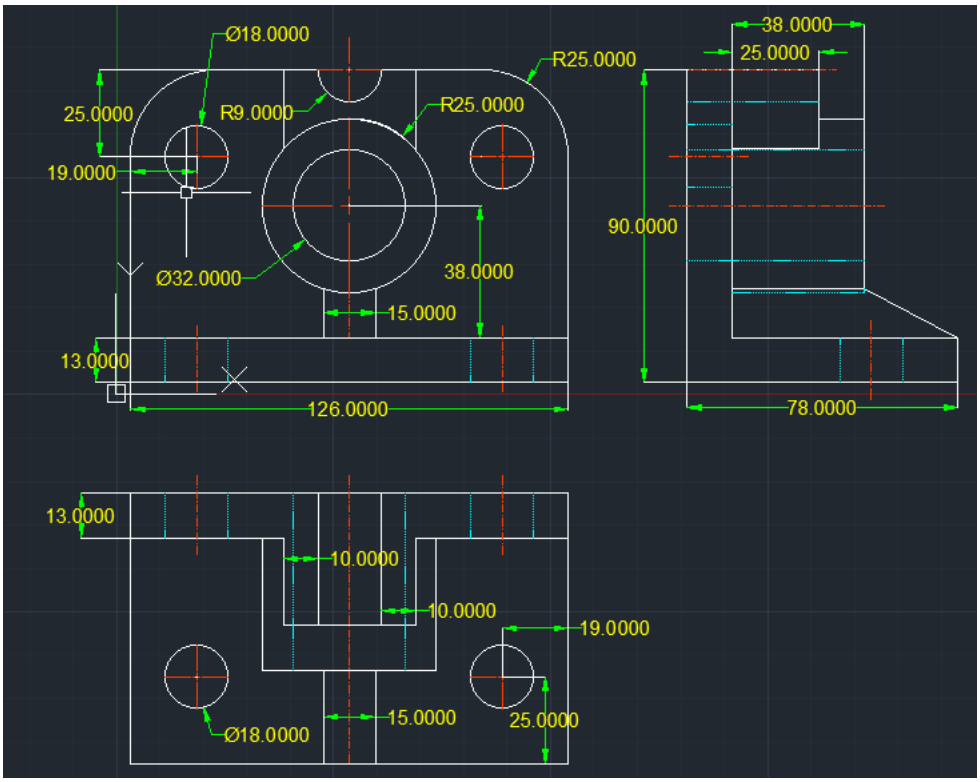
2. **Starting with the Front View**: I started all my drawings with the front view.
3. **Making the side view**s: Then I made the side view by extending lines from the corner of the front view accordingly.
4. **Making the Top or Bottom view**: The Top and Bottom Vies were also created by extending lines from the corners of the Front View.
5. **Trimming**: I then trimmed off extra edges and division lines of the page.
6. Adding different lines: I coloured and added the required lines like the **Centre Line & Hidden Lines**.
7. **Dimensioning**: I then added appropreate dimensions to the drawing ensuring that unnecessary dimensions are not added and all the necessary one are shown.
8. **Review**: I reviewed my drawing to ensure that there are no mistakes in the drawing.

## Drawing No. 1



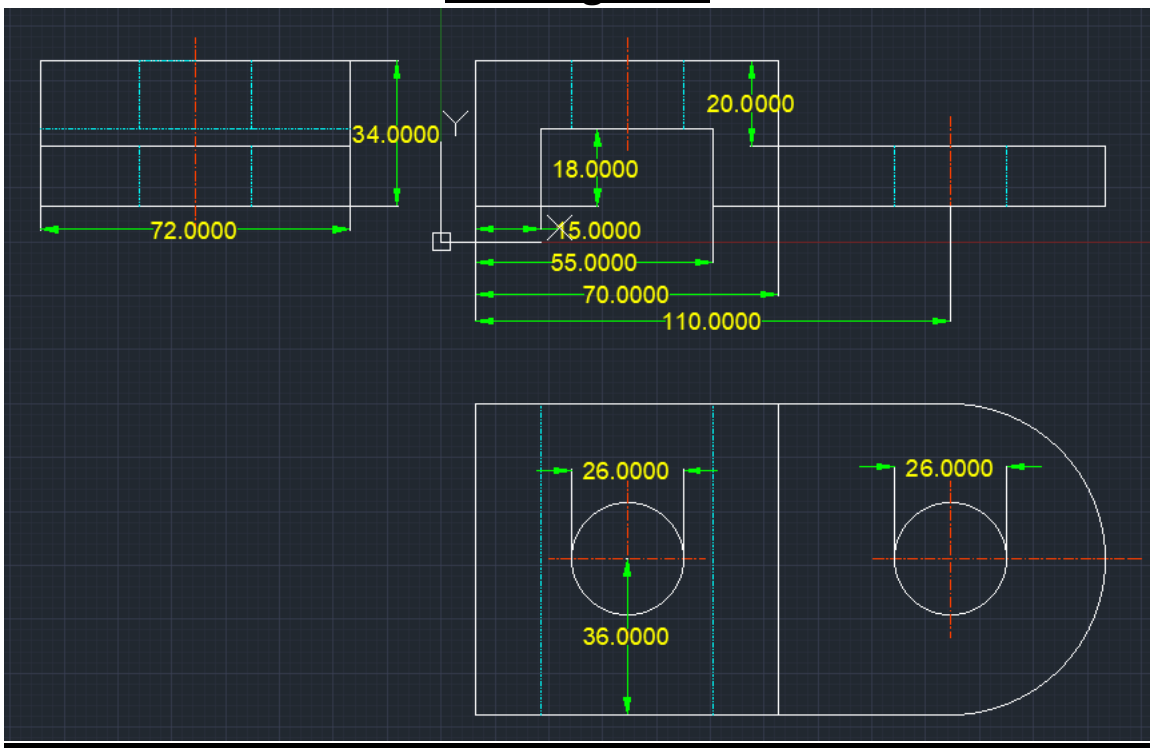

- This drawing was made with the **Right Side View.**

# Drawing No. 2




- This drawing was made with the **Left Side View**.

## Drawing No. 3




- This drawing was made in the **3rd Angle Projection** with **Right Side View**.

## CONCLUSION:

In conclusion, this assignment provided a thorough investigation into orthographic projection techniques with AutoCAD.

Through the application of 1st Angle Projection principles, students acquired valuable insights into the detailed process of representing three-dimensional objects in two dimensions.