



**R.C.Patel College Of Engineering &
Polytechnic, Shirpur**
Department of Civil Engineering



Course Title- Building planning & Drawing with CAD

Course Code -313009

Programme Name -Civil Engineering

Semester-Third

Unit	Title	COs	Learning hours	R Level	U Level	A Level	Total Marks
V	Introduction to 3-Dimensional drawings	CO5	4	-	-	-	-

Syllabus:

5.1 Isometric drawing: meaning and necessity, use of isometric snap, isometric axes, isocircle, isotext

5.2 3-Dimensional drawing: Use of, Extrude, Press pull, Union, Subtraction command for preparing drawing of components-Beam, Columns etc.

Subject Teacher

Mr.R.B.Patil

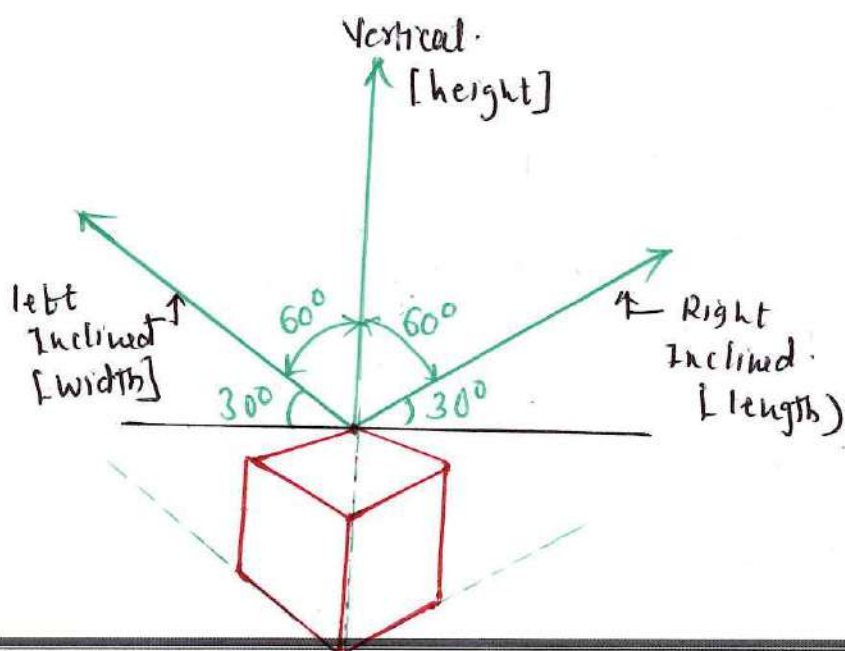
ISOMETRIC SNAP:- is a drawing Aid available in CAD that restricts the cursor movement to the three isometric axes [30° , 90° and 150°]

- It helps to users to draw isometric views accurately
- Simplifies the creation of 3D object in 2D.

short cut key:- F5 or Ctrl+E

ISOMETRIC AXES:-

- Isometric axes are the three reference axes used to draw an isometric view of an object.
- They represents the 3-D such as length, width and height.

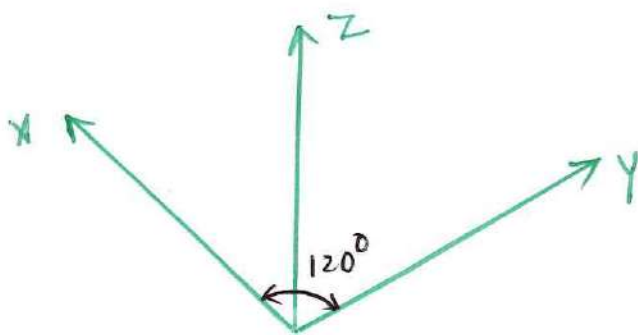


Prepared by Mr. Rahul B. Patil, ME (Computer Aided Structural Engg.)
Dept. of Civil Engineering RCPCEP, Shirpur

Page-

ISOMETRIC DRAWING:-

Isometric drawing is a pictorial representation of an object in which three principal axes are equally inclined at 120° to each other. It helps visualize 3D objects on a 2D sheet.



Necessity :-

1. 3-D visualization:- It helps to understand the 3D dimensions and shape of any object without requiring multiple views.
2. Ease to Interpretation:- It makes complex engineering components easy to read.
3. Design and planning:- It improves in the design, modification and planning of structure.
4. Helps in error elimination:- It reduces the error while designing and manufacturing.

Prepared by Mr. Rahul B. Patil, ME (Computer Aided Structural Engg.)
Dept. of Civil Engineering RCPCEP, Shirpur

Page-

Features :-

- They are equally spaced at 120°
- Measurements are taken along these axes
- All edges are parallel to the principal axes

ISOCIRCLE :-

Isometric representation of a circle, since a true circle cannot be drawn directly in an isometric view, it appears as an ellipse called an ISO-circle.

How to draw ISO circle

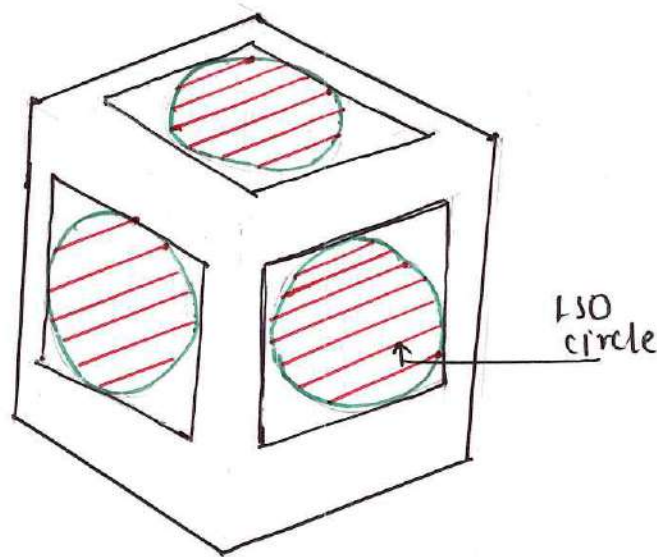
↓
Isometric snap [ON]

↓
Select required ISO plane
[Ctrl+E]

↓
Select ISO circle

↓
Select centre point

↓
Enter dimension [radius]



ISOTEXT :- It is a text that is aligned with the isometric planes in an isometric drawing so that it appears to follow the orientation of the object.

- It improves the readability and professional appearance of drawings.

Command :- used MTEXT
to create text

↓
use TEXTEDIT to
adjust the text

↓
Apply oblique angle

Dimensional Drawing using AutoCAD 3D Commands

Objective

To prepare 3D components such as beams and columns using Extrude, Press Pull, Union and Subtract commands

Commands

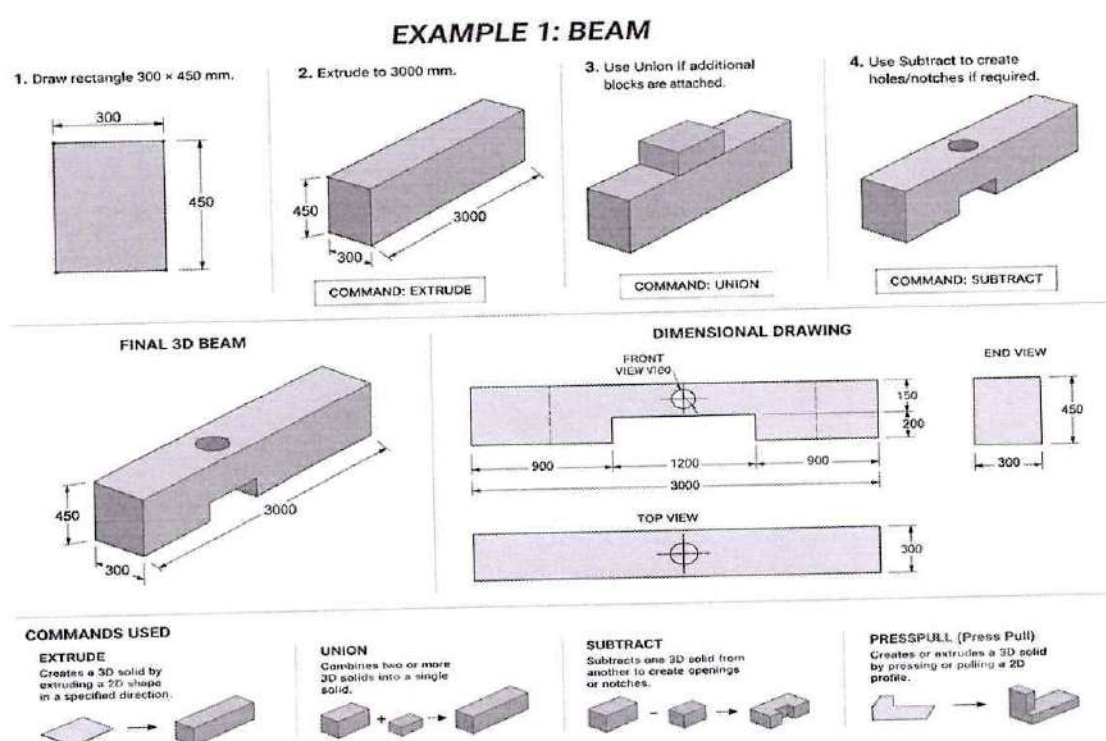
Extrude: Converts a 2D closed object into a 3D solid by giving height. Steps: Draw closed profile → EXTRUDE → Select object → Enter height.

Press Pull: Creates or modifies 3D solids by pushing/pulling enclosed areas. Steps: PRESSPULL → Click inside boundary → Drag or enter distance.

Union: Joins two or more touching 3D solids into one solid. Steps: UNION → Select solids → Enter.

Subtract: Removes one solid from another. Steps: SUBTRACT → Select main solid → Enter → Select cutting solid → Enter

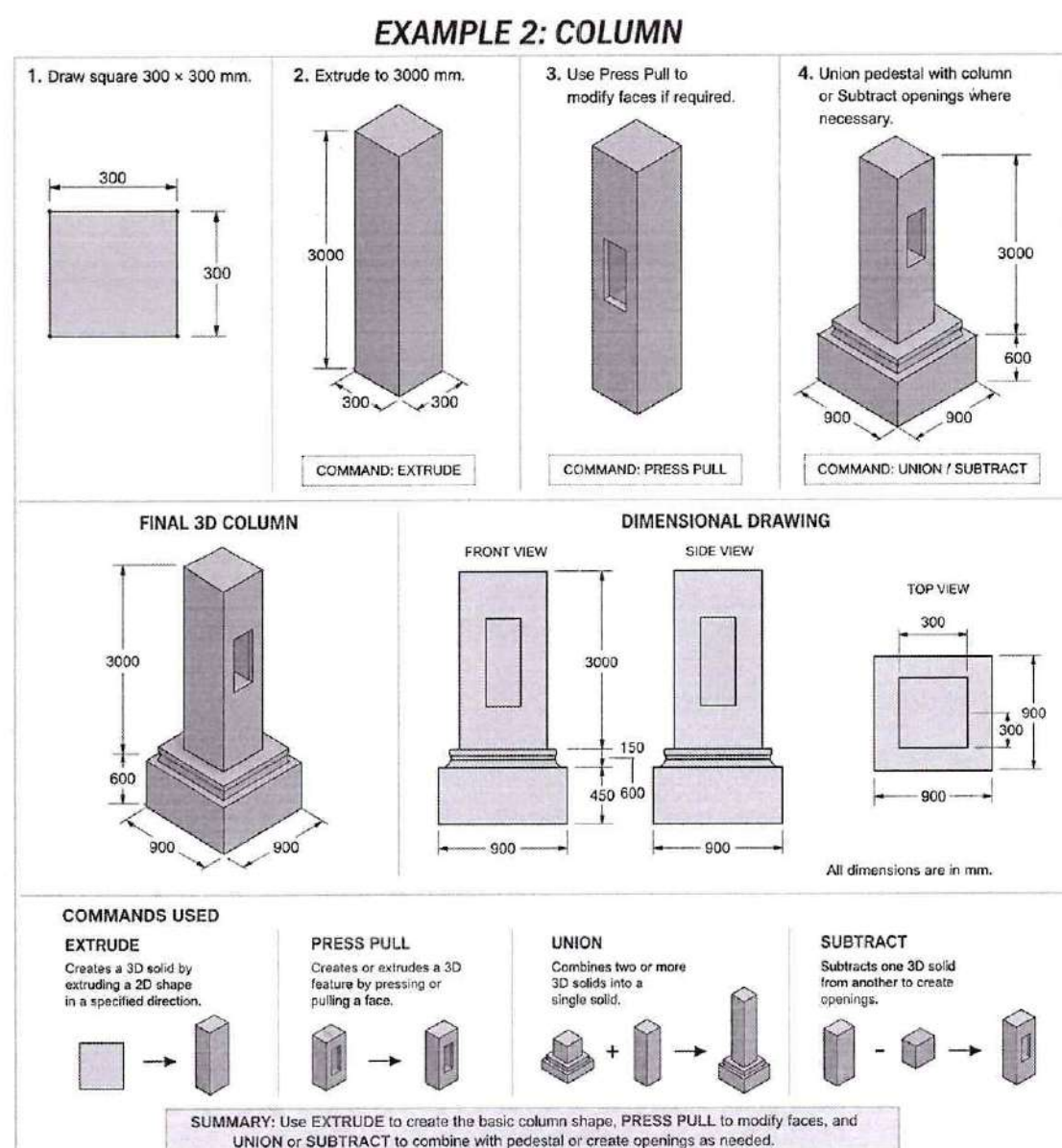
Example 1: Beam 1. Draw rectangle 300 × 450 mm. 2. Extrude to 3000 mm. 3. Use Union if additional blocks are attached. 4. Use Subtract to create holes/notches if required.



Prepared by **Mr.Rahul B.Patil**, ME (Computer Aided Structural Engg.)
Dept. of Civil Engineering RCPCOEP, Shirpur

Page-

Example 2: Column 1. Draw square 300 × 300 mm. 2. Extrude to 3000 mm. 3. Use Press Pull to modify faces if required. 4. Union pedestal with column or Subtract openings where necessary.



Prepared by **Mr.Rahul B.Patil**, ME (Computer Aided Structural Engg.)
Dept. of Civil Engineering RCPCOEP, Shirpur

Page-