## ONLINE SOFTWARE TRAINING REPORT

ON



#### INTERNSHALA

Submitted in partial fulfilment of the

requirements for the award of degree of

**Bachelor of Technology** 

In INDUSTRIAL & PRODUCTION ENGINEERING



Submitted To : Kailash Borkar (Asst. Professor) I.P.E, SOSE&T, GGV, BILASPUR Submitted By : Abhijeet Katyayan (17105221)



School Of Studies Engineering & Technology

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G)

## **ACKNOWLEDGEMENT**

I am highly grateful to **Mrs. Arpita Roy Choudhury, HOD (IPE Department)** for providing this opportunity to carry out one-month practical training at **INTERNSHALA**.

The constant guidance and encouragement received from **Mr**. **Kailash Borkar**, **Assistant Professor (IPE Department)** has been of great help in carrying out the project work and is acknowledged with reverential thanks.

I would like to express a deep sense of gratitude and thanks profusely to **Mr. Tushar Jha, Instructor**, without the wise counsel and able guidance, it would have been impossible to complete the report in this manner.

I would like to express gratitude to other faculty members of **IPE** department for their intellectual support throughout the course of this work.

Finally, I am indebted to all whosoever have contributed in this report

# **CERTIFICATION**



# Abstract

Software training is one of the requirements to be fulfilled in order to obtain the Bachelor's Degree in Technology. Each student needs to do software training in a recognized company of their respective domain. The students are compulsory to the training for duration 1 month which is intended for their exposure to the software industry. A well planned, properly executed and evaluated software training helps a lot in developing a professional attitude. It develops an awareness of software approach to problem solving, based on a broad understanding of processes. Besides software training build self confidence among students and let students know the technical knowledge and professionalism.

During software training at "Interenshala", most of the theoretical knowledge gained during the course of studies was put to test. Various efforts and processes involved in designing of a component was studied and understood during the training. In our training I undertook course of AutoCAD.

The training gave me good experience from the view of implementing my theoretical knowledge in practical aspects. It gave me first-hand experience of working as an engineering professional. It helped me in improving my technical, interpersonal and communication skills, both oral and written. Overall, it is a great experience to have software training in such a reputed firm and I believe that it will help me in building a successful career.

## **CONTENTS**

- □ Introduction
- Benefits of AutoCAD
- □ AutoCAD Screen
- □ Methods to work in AutoCAD
- **Drawing Units**
- Dimension Style Manager
- □ Some Commands with Shortcut in AutoCAD
- Text Command
- Block Command
- Hatch Command
- □ Drawings made in AutoCAD
- □ Layout
- □ Drawing on Layout
- □ Isometric Drawing
- □ 3D Drawing
- □ 3D Drawing made in AutoCAD
- □ Conclusion

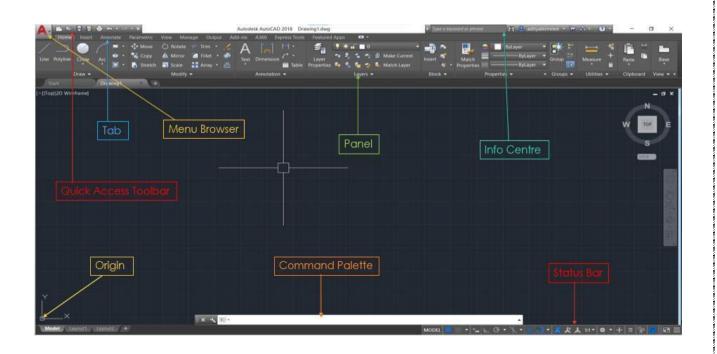
## **INTRODUCTION**

- □ AutoCAD is the software majorly used for drafting purpose.
- □ The word AutoCAD is made up of two words "Auto" (digital) and "CAD" (Computer Aided Designing).
- □ It is developed by Autodesk Company.
- □ CAD is a utility tool or technology that is used for sharing of information with the help of computer.

#### **BENEFITS OF AUTOCAD**

- □ File Handling
- Global File Sharing
- Easy to Modify
- More Accurate and Precised
- □ Improved Quality Over Hand Drafting
- □ More Reliable

#### AUTOCAD SCREEN



## **METHODS TO WORK IN AUTOCAD**

## \* GUI (Graphic User Interface):-



In this interface we can choose tools by selecting its graphical representation or icon to work in AutoCAD.

## \* CUI (Command User Interface):-



In this interface we can type the command in command palette to work in AutoCAD.

#### **DRAWING UNITS**

To set the Drawing Units, type **UN** then press **ENTER key**. Then a pop-up window will appear. Then do the changes as per requirements.

Then click **OK**.

	~
A Drawing Units	×
Length Iype: Decimal Precision: 0.0000 ~	Angle Type: Decimal Degrees Precision: 0 Clockwise
Insertion scale Units to scale inserted content Millimeters ✓ Sample Output 1.5.2.0039.0 3<45.0	
Lighting Units for specifying the intensity of lig International	hting:
OK Cancel	Direction <u>H</u> elp

## **DIMENSION STYLE MANAGER**

To set the Dimension Style, type **D** then press **ENTER key**. Then a pop-up window will appear. Then click on **Modify**.

Then do the changes as per requirements.

A Dimension Style Manager		×
Current dimension style: ISO-25 <u>S</u> tyles:	Preview of ISO-25	
Annotative ISO-25 Standard		Set C <u>u</u> rrent <u>N</u> ew <u>M</u> odify <u>Q</u> verride <u>C</u> ompare
List All styles ∽	Description ISO-25	
All styles ∨ ✓ Don't list styles in Xrefs		
	Close	Help

A Modify Dimension	Style: ISO-25			×
Lines Symbols and Arr	rows Text Fit	Primary Units	Alternate Units	Tolerances
Linear dimensions				
Unit format:	Decimal	$\sim$		<b>14,11</b>
Precision	0.00	$\sim$	16,6	
Fraction format:	Horizontal	$\sim$	<sup>φ</sup>   <u>+</u>	
Decimal separator:	'.' (Co	omma) 🗸 🗸		- ( / ) & / )
Round off:	0	•		
Prefix:			E.	,
Suffix:				
Measurement scale				
Scale factor:	1	-		
Apply to layout din	nensions only		Angular dime	ensions
Zero suppression	[] Tra	iling	Units format	Decimal Degrees $\vee$
Sub-units facto	or: 0 fe	0	Precision:	0 ~
100	×		Zero suppre	ession
Sub-unit suffix:	0 inc	ches	Leading	
				-
			ОК	Cancel Help

## SOME COMMANDS WITH SHORTCUT

1) Line :- L 2) Ortho :- F8 3) Grid :- F7 4) Osnap :- F3 5) Option :- OP 6) Offset :- O 7) Trim :- TR 8) Mirror :- MI 9) Pan :- PAN 10) Copy :- CO 11) Move :- M 12) Circle :- C 13) Rotate :- RO 14) Ellipse :- EL 15) Rectangle :- REC 16) Polyline :- PL 17) Join :- J 18) Explode :- X 19) Extend :- EX 20) Arc :- A 21) Fillet :- F 22) Ray :- RAY 23) Text :- T

24) Construction Line :- XL 25) Array Classic :- ARRAYC 26) Polygon :- POL 27) Area :- AA 28) Divide :- DIV 29) Point Style :- DDPTYPE 30) Leader Line :- LE 31) Special Line :- SPL 32) Stretch :- S 33) Scale :- SC 34) Hatch :- H 35) Hatch Edit :- HEDIT 36) Block :- B 37) Block Editor :- BE 38) Insert :- I 39) Design Centre :- DC 40) Table :- TB 41) Line Type :- LT 42) Line Weight :- LW 43) Colour :- COL 44) Match Properties :- MA 45) Drafting Setting :- DS 46) Line Type Scale :- LTS

47) Dimension of Linear Line :- DLI 48) Dimension of Aligned Line :- DAL 49) Dimension of Radius :- DRA 50) Dimension of Diameter :- DDI 51) Dimension of Angle :- DAN 52) Dimension of Arc Length :- DAR 53) Dimension of Cont. Line :- DCO 54) Write Block :- W 55) Plot / Print :- PLOT / CTRL+P 56) List :- LI 57) Limit :- LIMIT 58) Model View :- MV 59) External Reference :- XREF 60) Chamfer :- CHA 61) Extrude :- EXT 62) Presspull :- PRESS 63) Union :- UNI 64) Subtract :- SUB 65) Loft :- LOFT 66) Revolve :- REV 67) Sweep :- SWEEP

68) Slice :- SLICE

#### **TEXT COMMAND**

To write the text in AutoCAD, type **T** then press **ENTER key**. Then specify the corner points.

Then a rectangular window will appear where text can be typed. Also, from upper panel text size, font and colour can be changed.

A	Autodesk AutoCAD 2018 Draw		Type a keyword or phrase	🏦 🚨 adityahirminni 🔹 🦙 🔺 🛛 🕢	- o ×
	Aanage Output Add-Ins A360 Express Tools			🙈 🖻 More • 🛛 🗙	
AaBb123 AaBb123	The Defense	Line Spacing *	@     Image: Constraint of the second s	Find & Close	
🔺 Annotative Standard 🚽 🔝 Mask 📈			Check Dictionari		
Start Drawing1* +	Formatting 👻	Paragraph 👻 🔹	Insert Spell Check	Tools - Options Close	
[-][Top][2D Wireframe]					- a x
	· · · · · · · · · · · · · · · · · · ·				or for a for
Y					
×					
	X X MTEXT				
Model Layout1 Layout2 +			Model 📶 🔹 🐂 🛌 🕑 🔹	• 🕆 • 🖄 • 🔜 • 🧏 火 大 10 • 🌼	• + = 20 😒 📼 =

#### **BLOCK COMMAND**

When the same object shown multiple times in a diagram then we use block command. First, we draw that object then type **B** then press **ENTER key**. Then a pop-up window will appear where we first provide a name then select the object then specify pick point. Then click **OK**.

To insert the block, we first type I then press **ENTER key**. Then select the block by choosing its name. Then click **OK**. Then click on screen with left mouse button to put that object where it is required.

A Block Definition				×		1
Name:	v					
Base point	Objects	Behavior				
Specify On-screen	Specify On-screen	<u>A</u> nnota	ative			
₽ic <u>k</u> point	+ Select objects		latch block orientation layout			
<u>X</u> : 0	<u>◯ R</u> etain	<u>S</u> cale	uniformly			
<u>Y</u> : 0	<u>C</u> onvert to block	Allow e	exploding			
<u>Z</u> : 0	○ <u>D</u> elete <u>∧</u> No objects selected					
Settings	Description					
Block <u>u</u> nit Millimeters			^			
Hyper <u>l</u> ink			~			
Open in block editor	OK	(	Cancel <u>H</u> elp		Ш	
A Insert						$\times$
Name: Cylinder				~	<u>B</u> rowse	
Path:						
Locate using <u>G</u> eographic [	Data					
Insertion point	Scale		Rotation			
✓ Specify On-screen	Sp <u>e</u> cify On-screen		Specify On-scre	een		
<u>×</u> : 0	<u>X</u> : 1		Angle: 0			
<u> </u>	¥: 1		Block Unit			
<u>Z</u> : 0	<u>Z</u> : 1		Unit: Millimete	ers		

## HATCH COMMAND

Factor:

Uniform Scale

Explode

1

ОК

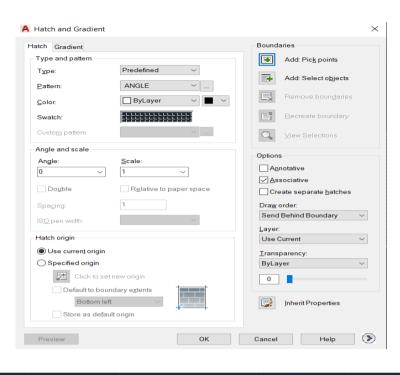
<u>H</u>elp

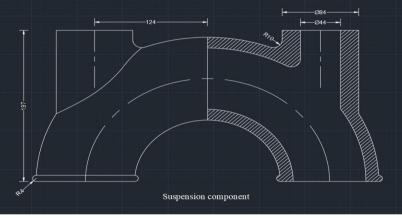
Cancel

Hatching is used in technical drafting to communicate that an area of the drawing has a particular attribute. It indicates that a section cut through a part is a particular material or attribute.

For hatching, type **H** then press **ENTER key** then type **T** then press **ENTER key**. Then a pop-up window will appear on screen. Then we change pattern, colour, angle and scale according to the requirements. Then click **OK**.

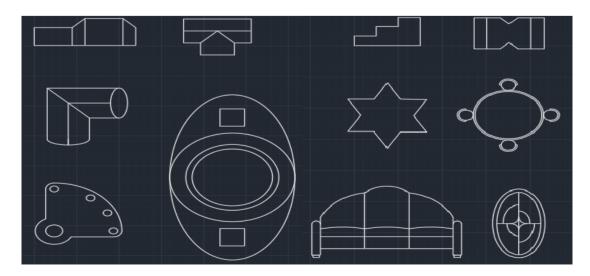
If we have to edit the hatching, type **HEDIT** then press **ENTER key** and click on the hatched area and do the changes.



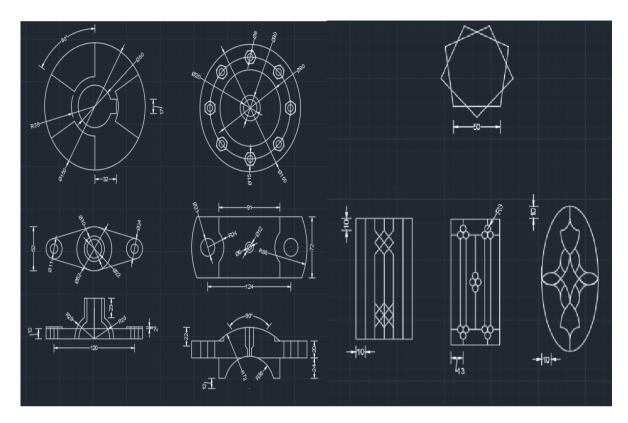


#### **DRAWINGS MADE IN AUTOCAD**

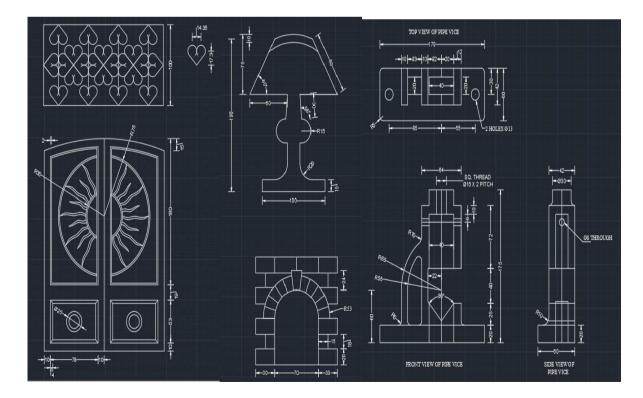
#### ✤ By the use of line, offset, osnap, trim, mirror, circle, ellipse, arc commands.



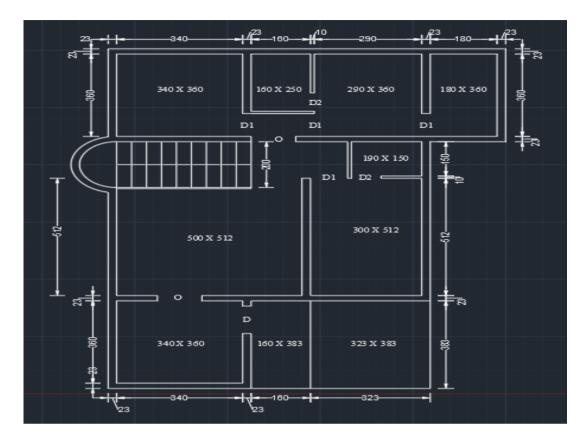
By the use of line, offset, osnap, trim, mirror, circle, arrayclassic, ellipse, arc commands.



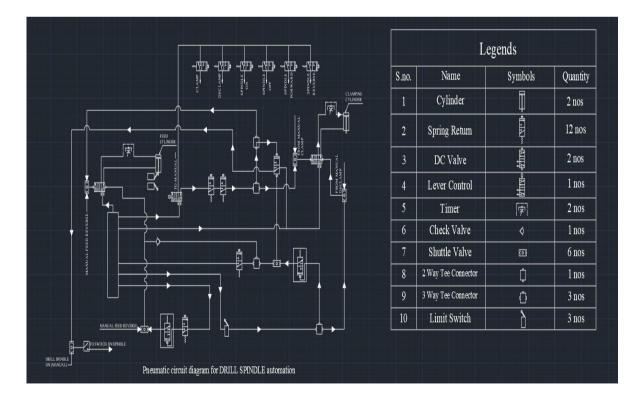
✤ By the use of line, offset, copy, osnap, trim, mirror, circle, special line, arrayclassic, ellipse, arc, construction line commands.



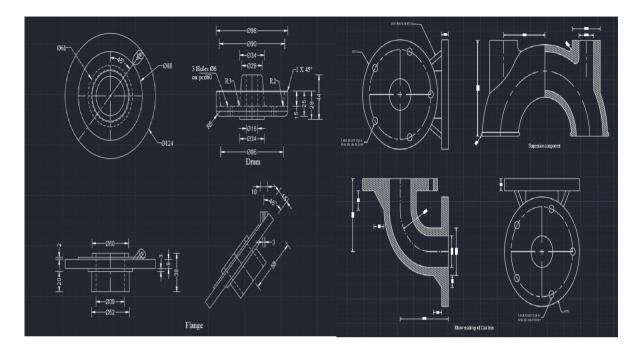
By the use of line, offset, divide, point style, osnap, trim, fillet, construction line commands.



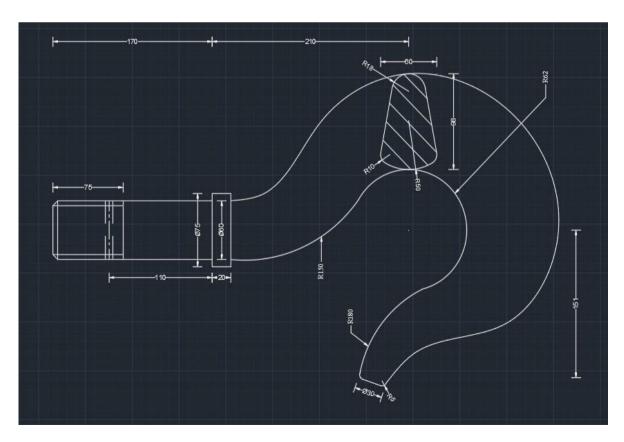
✤ By the use of line, offset, block, insert, osnap, line type, trim, circle commands.



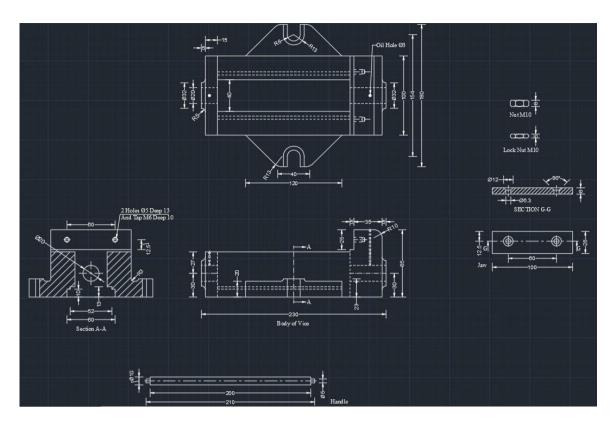
✤ By the use of line, offset, rotate, ellipse, fillet, osnap, line type, hatch, arrayclassic, trim, circle, construction line, special line commands.

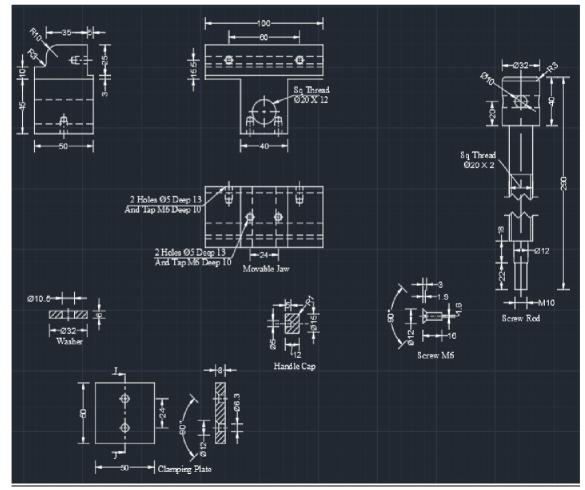


By the use of line, offset, fillet, osnap, line type, hatch, trim, circle, special line, arc commands.



By the use of line, offset, fillet, osnap, line type, hatch, trim, circle, extend, stretch, arc, construction line commands.





## **LAYOUT**

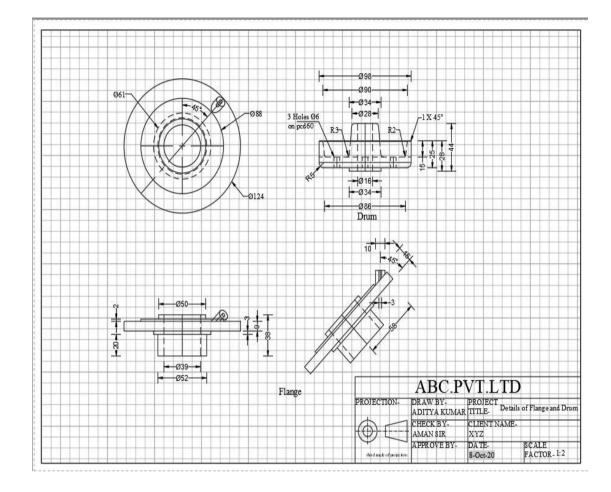
When we have to insert a diagram in required size of paper or with title box then we use layout function. First, go to layout. Then right click on it and go to page setup manager. Then go to modify and set the file type, paper size and orientation of paper. Then right click on model view and delete it. Then create a new model view by typing MV then press ENTER key. Then double click inside the model view to activate it and set the desired scale and object for printout. Then double click outside the model view to activate layout. Then CTRL + P and take the print out.

	New Layout From Template Delete Rename Move or Copy Select All Layouts	с. 
	Activate Previous Layout Activate Model Tab	
N	Page Setup Manager Plot	
	Drafting Standard Setup	
	Import Layout as Sheet Export Layout to Model	
Model Flange and D	Dock above Status Bar	Hook

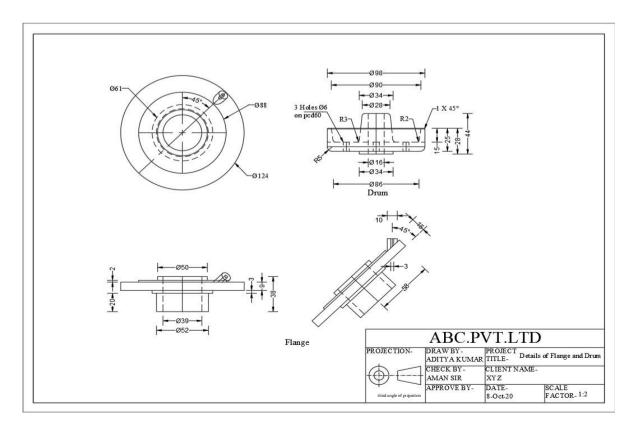
A Page Setup - Flange and Drum		×
Page setup Name: <none></none>	р <mark>ис</mark> т	Plot style table (pen assignments)
Printer/plotter Name: DWG To PDF.pc3 Plotter: DWG To PDF - PDF ePlot - by Autodesk Where: File Description: PDF C	Properties	Display plot styles  Shaded viewport options  Shade plot As displayed  Quality Normal  DPI 100
Paper size ISO full bleed A4 (297.00 x 210.00 MM)	~	Plot options Plot object lineweights Plot transparency
Plot area What to plot: Layout V	Plot scale Fit to paper Scale: 1:1	<ul> <li>Plot with plot styles</li> <li>Plot paperspace last</li> <li>Hide paperspace objects</li> </ul>
Plot offset (origin set to printable area)           X:         0.00         mm         Center the plot           Y:         0.00         mm         Center the plot	1 mm v = 1 unit Scale lineweights	Drawing orientation O Portrait (a) Landscape D Plot upside-down
Preview	ОК	Cancel Help

## **DRAWING ON LAYOUT**

#### ✤ In DWG form on layout



#### In PDF form



#### **ISOMETRIC DRAWING**

Isometric projection is a method for visually representing 3D objects in 2D in technical and engineering drawings. In this projection, all three angles made by X, Y and Z axis are 120° each.

To make isometric drawing, we have to first go to drafting setting by typing **DS** then press **ENTER key**. Then go to **snap and grid**. Then go to **snap type** and click on **Isometric snap**.

A Drafting Settings	×
Snap and Grid Polar Tracking Object Snap 3	O Object Snap Dynamic Input Quick Propert 🔸 🕨
Snap On (F9)         Snap spacing         Snap X spacing:         17.320508075         Snap Y spacing:         10         ✓ Equal X and Y spacing         Polar spacing         Polar distance:         0         Snap type	<ul> <li>Grid On (F7)</li> <li>Grid style <ul> <li>Display dotted grid in:</li> <li>2D model space</li> <li>Block editor</li> <li>Sheet/layout</li> </ul> </li> <li>Grid spacing <ul> <li>Grid X spacing:</li> <li>17.320508075</li> <li>Grid Y spacing:</li> <li>10</li> <li>Major line every:</li> </ul> </li> </ul>
<ul> <li>Grid snap</li> <li>Rectangular snap</li> <li>Isometric snap</li> <li>PolarSnap</li> </ul>	Grid behavior         Adaptive grid         Allow subdivision below grid         spacing         Display grid beyond Limits         Follow Dynamic UCS         OK       Cancel

- □ Rules on Isometric Drawing:-
- 1. Ortho should always be on.
- 2. Use F5 key to change between planes.
- 3. Circle, Rectangle, Mirror and Offset commands should not be used in isometry.



## **3D DRAWING**

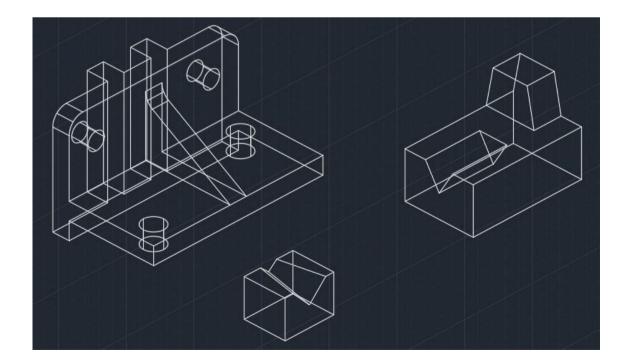
3D Drawing is used to depict something that has volume or space.

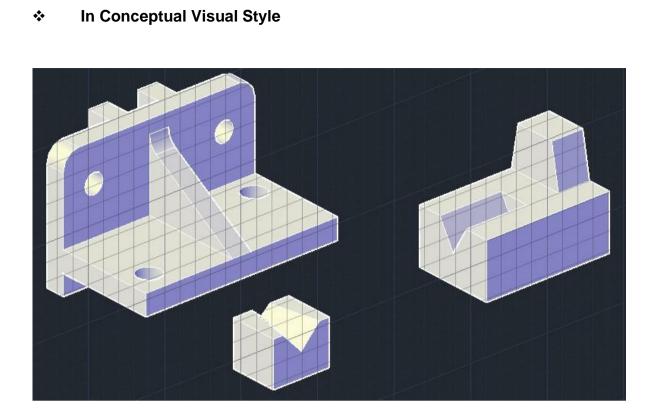
#### □ Rules on 3D Drawing:-

- 1. Object must be in polyline.
- 2. Object must be in a closed loop.
- 3. Loop should not be self- intersecting.
- □ Commands to convert objects from 2D to 3D:-
- 1. **EXTRUDE:-** Type **EXT** then press **ENTER key**. Then select the objects to extrude then press **ENTER key**. Then specify height then press **ENTER key**. It is used to create solid model.
- 2. **PRESSPULL:-** Type **PRESS** then press **ENTER key**. Then select face and specify the changes.

## **3D DRAWING MADE IN AUTOCAD**

- □ By the use of line, rectangle, circle, extrude, union, subtract, move, copy commands.
  - \* In 2D Wireframe Visual Style





#### **CONCLUSION**

This report covered the preview of our learning path and study materials. The use of AutoCAD has many advantages. It can help to reduce the time it takes to produce the drawing needed in the work environment. AutoCAD software is the most amazing range of mechanical computer aided design tool. It is now considered to be the best according to industry standards that can be obtained for a wide array of designing, Mechanical Engineering Services and other industrial purposes.

The use of AutoCAD may also be relied on heavily in order to create efficiencies within the industries. We were guided by the fact that there is more to learning AutoCAD than drawing simple figures and lines. It has very vast application in the field of manufacturing, architecture, electrical, and many more. With the help of AutoCAD, we can create design very quickly. It improves the quality of the drawing which we can't get by hand drafting. With the help of this software, drawing can be easily modified whenever wanted which reduces the human effort. We can easily transfer files from one place to another in no time which reduces the time.

This software is utilized to provide some useful and practical designing software that will allow users to visualize as well as create prototypes of a product in reality and quick time. AutoCAD software allows developers to give form to their out of the box ideas.

\*\*\*\*\*\*\*\*