OPENCOURSEWARE



ENGINEERING DRAWING SKKK 1021

FUNDAMENTALS

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LEARNING OUTCOMES

INTRODUCTION TO ENG. DRAWING

It is expected that students will be able to:

 Identify and using the basics of engineering drawing







FUNDAMENTALS OF ENG. DRAWING

- INTRODUCTION
- ALPHABETS AND NUMBERS
- ENGINEERING DRAWING LA
- TYPES OF LINES
- SCALES
- DIMENSIONING





INTRODUCTION Elements of Engineering Drawing

Engineering drawing are made up of graphics

language and word language.



Describe a shape (mainly).



Describe size, location and specification of the object.







INTRODUCTION (cont'd)

Basic Knowledge for Drafting







ALPHABETS AND NUMBERS

Text on Drawings

Text on engineering drawing is used :

- To communicate nongraphic information.
- As a substitute for graphic information, in those instance where text can communicate the needed information more clearly and quickly.

Thus, it must be written with

- *Legibility* shape
- - space between letters and words
- **Uniformity** size
 - line thickness





ALPHABETS AND NUMBERS (cont'd)







ALPHABETS AND NUMBERS (cont'd)

Lettering Standard

ANSI Standard

- Use a Gothic text style, either inclined or vertical.
- Use all capital letters.
- Use 3 mm for most text height.
- Space between lines of text is **at least** 1/3 of text height.

This course

- Use only a Normal
 - text style.
- Use both capital and
 - lower-case letters.
- For letters in title block it is
 - recommend to use 5 mm
 - text height





ENGINEERING DRAWING LAYOUT

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TYPES OF LINES Basic Line Types

Types of Lines	Appearance	Name according to application
Continuous thick line		Visible line
Continuous thin line		Dimension line
		Extension line
		Leader line
Dash thick line		Hidden line
Chain thin line		Center line





TYPES OF LINES (cont'd) Meaning of Lines

Visible lines represent features that can be seen in the

current view

Hidden lines represent features that <u>can not be seen</u> in the current view

Center line represents symmetry, path of motion, centers of circles, axis of axisymmetrical parts

Dimension and Extension lines indicate the sizes and location of features on a drawing





TYPES OF LINES (cont'd)

Example : Line conventions in engineering drawing







SCALES

Drawing Scales

Length, size

Scale is the ratio of the linear dimension of an element

of an object shown in the drawing to the real linear

dimension of the same element of the object.

Size in drawing

Actual size











Designation of a scale consists of the word "SCALE" followed by the indication of its ratio, as follow

SCALE 1:1for full sizeSCALE X:1for enlargement scales (X > 1)SCALE 1:Xfor reduction scales (X > 1)

Dimension numbers shown in the drawing are correspond to "true size" of the object and they are independent of the scale used in creating that drawing.



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DIMENSIONING

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PROCESS	RESULT	TRANSFERRED INFORMATION
Design a part	Sketches of ideas	
Create drawings	Multiview Drawing	Shape
	Dimensioning	 Size, Location Non-graphic information







Dimensioning is the process of specifying part's

information by using of **figures**, symbols and notes.

This information are such as:

- 1. Sizes and locations of features
- 2. Material's type
- **3. Number required**
- 4. Kind of surface finish
- 5. Manufacturing process
- 6. Size and geometric tolerances



2. Decimal-inch system

Examples 0.25 (not .25), 5.375 etc.

3. Fractional-inch system

Examples
$$\frac{1}{4}$$
, $5\frac{3}{8}$ etc.

OPENCOURSEWARE COMPONENTS COMPONENTS

Extension lines

Dimension lines

(with arrowheads)

Leader lines

Continuous thin line

Dimension figures

Notes :

- local note
- general note

Using text function



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EXTENSION LINES

indicate the location on the object's features that are dimensioned.



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OPENCOURSEWARE DIVENSION LINES

indicate the direction and extent of a dimension, and inscribe *dimension figures*.







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indicate details of the feature with a *local* note.

LEADER LINES







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PLACEMENT OF DIMENSION

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 Extension lines, leader lines should not cross dimension lines.

POOR

GOOD







2. Extension lines should be drawn from the nearest points to be dimensioned.





3. Extension lines of internal feature can cross visible lines without leaving a gap at the intersection point.

WRONG

CORRECT







4. **Do not** use object line, center line, and dimension line as an extension lines.





5. Avoid dimensioning hidden lines.





6. Place dimensions **outside** the view, unless placing them inside improve the clarity.

POOR



GOOD



6. Place dimensions **outside** the view, unless placing them inside improve the clarity.



7. Apply the dimension to the view that clearly show the shape or features of an object.

8. Dimension lines should be lined up and grouped together as much as possible.

POOR

9. Do not repeat a dimension.

III **END** OF **CHAPTER 2**