TECHNICAL TRAINING INSTITUTE, TAKATPUR, MAYURBHANJ, ORISSA.

LESSON PLAN

Skilled in ODISHA

Trade - ALL TRADE 1ST YEAR

Name - BILASINI DAS

Lesson No. -

Time -

Date -

Title - HEIGHT AND WIDTH OF LETTERING

Objective - On completion of this lesson the trainees shall be able to -

The engineering practice, the size of letters means the height of the letters. The uniformity of lettering means keeping the height, inclination, spacing and strength of letters to be same. It is very essential for good letting in engineers drawing

Preparation/motivation/Introduction

uniformity in height can be obtained by drawing guide lines (2) The uniformity in inclination can be assumed by drawing perpendicular

Presentation -

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	The height of letters depend upon the purpose BIS (SP 46:2003) has recommended the height as 18 mm, 3.6mm, 5mm, 7mm, 14 mm and 20mm. Large size letters are useful for heading and main titles, medium sized letters are used for subtitles, lower size letter are used for subtitles, lower sizes letters used for dimension and general notes. Normally the width to height ratio 5:7, 6:7 for all capital letters. The letters I and 1 are the narrowest while the letters W is the width width of different letter groups. The line width of a letter is dependend on the height large sized	

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Industrial Training Institute

LESSON PLAN

Skilled in ODISHA

Trade :- ALL TRADE IST YEAR
Name :- BILASINI DAS

Lesson No. :-
Time :-
Date :-

Title :- GENERAL ROLES FOR LETTERING

Objective :- On completion of this lesson the trainees shall be able to :-

In engineering drawing lettering plays an important role as it explains those parts of the object which cannot be shown by line on the other hand a poor lettering not only mars the appearance of drawing but sometimes leads wrong result which causes a wastage of time and labour. The general proportion of lettering means the relationship between height, width and spacing of each letters.

Preparation/motivation/Introduction :-

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
1 ⇒	All letters should be written in capitals. The lower case letters should be used only when they are accepted in the international usage for short hand.	
2 ⇒	All letters and numberals should be written in such away that they do not touch each other or the lines.	
3 ⇒	letters should be spaced in such a manner that the area between them appears equal. At the same time. It is not necessary to keep clearance between adjacent letters, equal for example letters like H, I, M and N its adjacent should be spaced more widely than C, G and O.	

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	4) All the letters should be written in such a manner that they appear upright from the bottom edge, except when they are used in dimensioning. 5) Two words must have a space of about one letter between them.	

Summarization : In an important part of drawing and is used to write letters dimensions, notes and other necessary information required for complete execution of a machine or structure etc.

Application : (1) What do you understand by uniformity in lettering.

Test :- (2) What do you mean by composition of letters.

References :

Next lesson :-

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LESSON PLAN

Trade :- ALLTRADE 1ST YEAR

Name :- BILASINI DAS

Lesson No :-

Time :-

Date :-

Title :- LETTERING (BIS SP: 46 2003)

Objective :- On completion of this lesson the trainees shall be able to :-

Writing of titles, dimensions, notes and other important particulars on a drawing is called lettering. It is an important part of drawing. Lettering should be done properly in clear and uniformity style.

Preparation/motivation/Introduction :- In engineering drawing, lettering plays an important role as it explains those parts of the object which cannot be shown by lines on the drawing. Other hand, a poor lettering not only mars the appearance.

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
i ⇒	Single stroke	
ii ⇒	Double stroke letter is single stroke and double stroke letter may be inclined or vertical. The line width of a double stroke letter is greater than that of single stroke letter BIS (SP46:2003) recommend the use of type A and they B lettering. The line width of type A letters is always less than the type 'B' lettering. Therefore, they may be treated as equivalent of single stroke and double stroke respectively.	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
REQUIREMENTS OF GOOD LETTERS →	In engineering drawing a good lettering must fulfill the following purposes. → The knowledge of the shape and proportion of each letter. → The knowledge of the order and direction of the strokes used in making letters. → The knowledge of the general composition of letters. The knowledge of the rules of combining letters into words and words into sentences. → The knowledge of the writing the letters in plain and simple styles so that the lettering can be done free hand and speedy.	

Summarization: It is an important part of drawing and is used to write letters, dimensions, notes and other necessary information required from the letters execution of machine or structure etc.

Application: (1) What is the mean of letting.

Test :- (2) What are the main requirements of lettering.

References:

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LESSON PLAN

Trade: ALL TRADE 1ST YEAR

Lesson No:

Name: BLASINI DAS

Time:

Date:

Title: CLASSIFICATION OF LETTERING

Objective: On completion of this lesson the trainees shall be able to:

The order and direction of the stroke that forms the letters small variation are permissible while combining the letters to form words but great care must be exercised to preserve the general proportion and direction order and direction so that the letters will look well together.

Preparation/Motivation/Introduction

Presentation

Lettering can be classified into the following three basic groups

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
GOTHIC LETTERING	The lettering in which all the alphabets are of uniform width or thickness is known as gothic lettering. The gothic lettering may be further divided into the following groups.	
VERTICAL OR UPRIGHT GOTHIC LETTERING	(i) Single stroke vertical gothic lettering. (ii) Double stroke vertical gothic lettering (iii) Lower case italic gothic lettering. The lettering in which the direction of alphabets is vertically upward is known as vertical or upright gothic lettering.	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
SINGLE STROKE VERTICAL GOTHIC LETTERING →	The lettering in which the alphabets are of the same thickness is called single stroke vertical gothic lettering.	
DOUBLE STROKE VERTICAL GOTHIC LETTERING →	The lettering in which the alphabets written by double stroke of the pencil or pen with a uniform spacing in between the strokes is called double strokes vertical gothic lettering.	
LOWER CASE VERTICAL GOTHIC LETTERING	The lettering in which the alphabets are of small letters such as a, b, c, --- z etc. is called a lower case lettering.	

Summarization : The lettering in which the direction of alphabets is inclination to the horizontal line is known as inclination or italic lettering. An inclination of about 75° is recommended.

Application : Irem the right towards the left according to indian standards.

Test :- ① What do you mean by single stroke lettering.

② What is the gothic and Roman lettering.

References :

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Industrial Training Institute

LESSON PLAN

Skilled in ODISHA

Trade :- ALL TRADE IST YEAR

Lesson No. :-

Name :- ALLASINI DAS

Time :-

Date :-

Title :- LAYOUT OF DRAWING SHEET

Objective :- On completion of this lesson the trainees shall be able to :-

Know about layout of drawing sheet, margin Border lines.
Know about title block fixing the drawing sheet on the Board. Preparation of Drawing.

Preparation/motivation/Introduction: In engineering drawing, the preparation of a succesful drawing depends to a large extend on the layout of drawing sheet. For thing an engineer must know the stand rules and convention of drawing.

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
LAYOUT OF DRAWING SHEET:-	The selection of suitable scale and allotment of proper space for margin titleblock, folding marks etc. on the drawing sheet is known as layout of drawing sheet.	
MARGIN:⇒	A margin is provided around the sheet by drawing margin lines. The provision of margin lines will enable prints to be trimmed along margin lines. prints after trimming would be of recommended size of sheets.	
BORDER LINES:⇒	The clear working space on the drawing sheet is obtained by drawing border lines. in general practice more space is kept on the left side for filling or binding when necessary.	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
TITLE BLOCK	Title block is an important feature in drawing because it gives all the information of the preparing drawing. It is provided at the right hand bottom corner of the sheet. The recommended size of the title block by I.S.1 is 185mm x 65mm for all designation of the drawing sheets. All the block contains at least the following information 1- Name & title of drawing 2- Drawing number 3- Scale 4- Symbols denoting the method of projection 5- Name of firm. 6- Initials with dates, staff who have designed drawn, checked Standards and approved the drawing.	

Summarization: Layout of drawing sheet - Margin. Border lines, Title block, List of parts, Revision panel, Zone system, Numbering of sheets - folding marks and folding of sheets - fixing the sheet on the board.

Application: Preparation of drawing.

Test :-

① Why is the layout of sheet is necessary

② What are the standard size of drawing sheet according to I.S.1.

③ List about contents of title block and material list.

References

Next lesson :-

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Industrial Training Institute

LESSON PLAN

Skilled in ODISHA

Trade :- ALL THE TRADE 1ST YEAR

Name :- BILASINI DAS

Lesson No. :-

Time :-

Date :-

Title :- DRAWING OFFICE MATERIALS.

Objective :- On completion of this lesson the trainees shall be able to :-

- identify man-made and machine-made papers
- State the relationship between the sides of Standard size sheets
- designate and state the length and breadth of standard drawing sheet sizes.

Preparation/motivation/Introduction: The paper on which drawing is made is called a drawing sheet. For making a good drawing it is necessary that drawing sheet must be of uniform thickness and white as possible.

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
HAND-MADE PAPER	⇒ Hand-made paper have rough surfaces, pale in colour and not used for regular work, but meant of charts.	
MILL-MADE PAPER	⇒ Mill made papers are most commonly used for regular work and are available in different sizes and rolls. They are specified by their weight in kg per ream or density in grams per square meter.	
SIZE OF DRAWING SHEETS	⇒ While working or handling the papers are liable to tear on the edges. So slightly large size sheet are preferred. They are trimmed afterwards. IS:10811:1983 lays down such as designation of preferred trimmed	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
DESIGNATION OF SHEETS	and untrimmed sizes. The basic principle involved in arriving at the sizes of the drawing papers as under. The area of the biggest size (A0) is 1m² and its length and breadth are in the ratio 1:√2. Let x and y are the sides of the paper. The surface area of A0 is 1m². Then the sides are x = 0.841 m and y = 1.189 m. → The drawing sheets are designated by symbol as A0, A1, A2, A3, A4 and A5 Designation Trimmed size Untrimmed size A0 841 x 1189 880x1230 A1 594 x 841 625x880 A2 420 x 594 450x625 A3 297 x 420 330x450 A4 210 x 297 240x330 A5 148 x 210 165x240	

Summarization: The paper used for drawing depends entirely upon the character of drawing and its use. Drawing paper should be uniform and a white as possible.

Application: What are the standard sizes of drawing sheets according to I.S.I. ?

Test :- Which is suitable for drawing work.?

References :

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LESSON PLAN

Skilled in ODISHA

Trade :- ALL TRADE IST YEAR

Name :- BILASINI DAS

Lesson No. :-

Time :-

Date :-

Title :- NOTATION OF DIMENSIONING

Objective :- On completion of this lesson the trainees shall be able to :-

The main aim of a drawing is to represent the correct size of the object to be manufactured or constructed. It is therefore necessary that the drawing must carry the proper dimension and other information of the various parts of the object. The correct dimensioning will facilitate the technician in manufacturing.

Preparation/motivation/Introduction :-

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
DIMENSION LINE →	Dimension line is a thin continuous lines used to indicate the measurement which in a space above the dimension line or a space left in the dimension line.	
EXTENSION LINE →	Extension line is also a thin continous line extending beyond the outline of the object. It should extend about 3 mm beyond the dimension line.	
ARROW HEADS :- →	Arrow head are used to terminate dimension lines. These touch the extension lines and indicates the extent of a dimension. The length of the arrowhead is about three times its width. The space in the	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	the arrow-heads should be filled in. the size of the arrow-head should be proportionate to the thickness of the lines of the drawing.	
DIMENSION FIGURES :⇒	A numeral that indicates the size of a particular feature of an object is called dimension figures.	
LEADER :⇒	A leader is a thin continuous line drawn from note of the figure to show where it applies. It is terminated by an arrowhead or dot.	
NOTES ⇒	A notes on drawing give complete information regarding specific operation relating to a feature.	
SYMBOL ⇒	A symbol is the representation of any object by some mark on the drawing. It is used to save time and about of drawing work.	

Summarization : The art of writing the various size or measurements on the finished drawing of an object is known as dimensioning.

Application : (1) What is the importance of dimensioning

Test :- (2) What do you means by the term notation of dimensioning.

References :

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LESSON PLAN

Skilled in ODISHA

Trade :- ALL TRADE IST YEAR

Name :- BILASINI DAS

Lesson No :-

Time :-

Date :-

Title :- THEORY OF DIMENSIONING

Objective :- On completion of this lesson the trainees shall be able to :-

An object may be considered to be made up of a number of geometrical shapes such as prism, cylinder, pyramid, cone sphere etc. It then becomes very simple to dimension these geometrical forms in a manner that will show their individual sizes and location to each other.

Preparation/motivation/Introduction :-

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
SIZE DIMENSIONS →	The dimensions which indicate the various sizes of the object such as length, breadth, diameter etc. are known as size dimensions. These dimensions are represented by the letter 's'.	
LOCATION DIMENSIONING →	The dimensions which locate the position of one feature with respect to the other features are known as location dimensioning. Distance between the centre lines of the holes from the edges of features are given by location dimensions.	

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LESSON PLAN

Trade: ALL TRADE 1ST YEAR

Lesson No:

Name: BILASINI DAS

Time:

Date:

Title: THEORY OF DIMENSIONING

Objective: On completion of this session the trainees shall be able to

An object may be considered to be made up of a number of geometrical shapes such as prism, cylinder, pyramid, cone sphere etc. It then becomes very simple to dimension these geometrical bounds in a manner that will show their individual sizes and location to each other.

Preparation/Instruction/Introduction

Presentation

Points/Topics	Narration / information in short	Spot/Ionts/Instructor's guide
SIZE DIMENSIONS →	The dimensions which indicate the various sizes of the object such as length, breadth, diameter etc are known as size dimensions. These dimensions are represented by the letter S	
LOCATION DIMENSIONING →	The dimensions which locate the position of one feature with respect to the other features are known as location dimensioning. Distance between the centre lines of the holes from the edges of features are given by location dimensions.	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	The dimensions are marked by letters 'L'	

Summarization : The use of long letters should be avoided even if it involves repetition dimension or notes

Application : (1) What is leader? How a leader should be drawn?

Test :- (2) Explain the help of simple sketch
(1) Size dimensions
(2) Location dimensions.

References :

Next lesson :-

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LESSON PLAN

Skilled in ODISHA

Trade - ALL TRADE 1ST YEAR.

Name - BILASINI DAS

Lesson No -

Time -

Date -

Title - SYSTEM OF PLACING DIMENSIONS

Objective - On completion of this lesson the trainees shall be able to -

The correct dimensioning will facilitate the technician in manufacturing the part where as the wrong dimensioning may cause confusion and will lead to a great loss of time labour & material.

Preparation/motivation/Introduction

There bare dimensions should be done in a way which is located simply and easily understood by the technician.

Presentation -

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	There are two type of systems of placing dimensions on a finished drawing according to I.S.I.	
ALIGNED SYSTEM →	In this system all dimensions are so placed that may be read from the bottom or the right hand edges of the drawing sheet. Here all the dimensions are placed normal and above the dimension line.	
UNIDIRECTIONAL SYSTEM →	In this system all dimensions are so placed that may be read from bottom edge of the drawing sheet. There is no restriction on the	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	Controlling the direction of the dimension lines. Unidirectional system of placing dimensions are used on large drawings as of aero-crafts, automobiles etc. where it is convenient to read dimensions from right hand sides.	

Summarization : Aligned system of placing dimensions is commonly used in engineering drawing.

Application : (1) What are aligned system of dimensioning.

Test :- (2) What are unidirectional system of dimensioning.

References :

Next lesson :-

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	:→ Dimensions should be taken from visible outlines rather than from hidden lines :→ Dimensions should be given from a base line or centre line of a hole or an important hole or a finished surface :→ The crossing of dimension lines should be avoided if possible. :→ Dimension should be never be crowded. If the space is insufficient arrow-head may be replace by dots. :→ As far as possible dimensions should be given in one unit only preferably millimetres.	

Summarization : As far as possible all dimension should be given perfectly in one unit only. i.e is millimetres

Application : (1) What are the general rules of dimensioning.

Test :-

References :

Next lesson :-

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Industrial Training Institute

LESSON PLAN

Skilled in ODISHA

Trade - ALL TRADE IST YEAR
Name - BILASINI DAS.

Lesson No :-
Time :-
Date :-

Title - SIZES OF SCALE

Objective - On completion of this lesson the trainees shall be able to :-

In engineering drawing, it is often inconvenient to represent the actual size of the object e.g building on the drawing sheet. However, sometime it becomes essential

Preparation/motivation/Introduction - to increase the actual size of the object so as to give clear conception as in the case of small machine parts.

Presentation - mathematically instrument.

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
FULL SIZE SCALE	The scale in which the actual measurements of the object are drawn same size on the drawing is known as full size scale. It is written on the stick as under 1:1 – drawing made to actual size.	
REDUCING SCALE	The scale in which the actual measurements of the object are reduced to some proportion is known as reducing scale. The standard reducing proportion scales 1:2, 1:5, 1:10, 1:20, 1:50, 1:100 etc.	

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Points/Topics	Narration / information in short	Space for facilitator's guide
ENLARGING SCALE	The scale in which the actual measurements of the object are increased in some proportion is known as enlarging scale. The standard proportions are 2:1, 5:1, 10:1, 20:1, 50:1, 100:1 etc.	

Summarization: The proportion by which we either reduce or increase the actual size of the object on a drawing is known as drawing to scale or simply scale.

Application: (1) What is scale?

Test: (2) What is the difference between reducing and increasing scale

References:

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Skilled in ODISHA

LESSON PLAN

Trade :- ALL TRADE 1ST YEAR

Name :- BILASINI DAS

Lesson No :-

Time :-

Date :-

Title :- REPRESENTATIVE FRACTION(R.F) OR SCALE FACTOR (S.F)

Objective :- On completion of this lesson the trainees shall be able to :-

In order to prepare a drawing of any size a scale is essential. After the construction the figure a scale must be stated as scale 1cm=1 metre (M) or 1:100 or full size.

Preparation/motivation/Introduction:

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	The ratio of the distance on the drawing sheet of an object to the corresponding actual distance of the object is known as representative fraction or scale factors	
R.F. =	Distance on drawing sheet of the object (in same unit) / Corresponding actual distance of the object	
FOR EXAMPLE :-		
(1)	If 1 centimetre represents 1 metre then R.F $= \frac{1}{1\times10\times10} = \frac{1}{100}$ (same unit)	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	(ii) If 1 centimetre represents 1 kilometres then R.F. = $\frac{1}{1\times10\times10\times10\times10\times10}$ = $\frac{1}{100000}$ or 1 : 1,00,000 (iii) If 2.5 centimetres represent 5 hectometres then R.F. = $\frac{2.5}{5\times10\times10\times10\times10}$ = $\frac{1}{2,0000}$ or 1' 20,000	

Summarization: The Indian Standard Institution has introduced the metric system of measurements in place of British measures for its practical convenience and other reasons.

Application: (1) What is representative fraction R.F or scale factor S.F)

Test :- (2) What are the main uses of scale.

References :

Next lesson :-

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Industrial Training Institute

LESSON PLAN

Skilled in ODISHA

Trade :-

Name :-

Lesson No :-

Time :-

Date :-

Title :- PLAIN SCALES

Objective :- On completion of this lesson the trainees shall be able to :-

A plain scale is simply a line which is divided into suitable number of equal parts or units. The first part of which is further sub-divided into small parts or sub-units of main unit.

Preparation/motivation/Introduction:

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
POINTS TO DRAW SCALE.	In every scale, the following key points should be remembered while constructing a scale.	
1 →	Find the representative fraction. It not given.	
2 →	Find the length of the scale = R.F x Actual length of the object. [If the length of the scale is not mentioned in the problem, then take it about 15cm or 150 mm or 6 inches]	
3 →	The mark 0 (zero) should be placed at the end of the first main division.	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	4⇒ The main unit should be numbered to the right and its sub-units to the left from the zero mark. 5⇒ The scale on its R.F should be mentioned along with the figure. 6⇒ The name of main unit and it subunits should be mentioned either below or at the respective ends of the scale.	

Summarization: The plain scales are used to represent either two units or one unit and its fraction such as kilometres, hectometres or metres or decimetres or metres and 1/10th of metres etc.

Application:

Test:
1. Give the name of different types of scale.
2. What is the plain scale.

References:

Next lesson:

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LESSON PLAN

Trade: ALL TRADE 1ST YEAR
Name: Assistant Prof.
Lesson No.
Time
Date

Title: PROJECTION

Objective: On completion of this lesson the trainees shall be able to

(1) What is projection
(2) Different types of projection.
(3) What are different types of pictorial, drawing and perspective projections

Preparation/Motivation/Introduction: Engineering drawing is the universal graphic language by means of which the shape and size of an object can be specified on a plane of paper.

Points/Topics	Narration - information in short	Spot hints/Instructor's guide
INTRODUCTION	The image or figure, that formed on the paper by joining different points in order + sequence is known as projection of that object. It is therefore necessary for an engineer to acquire a good working knowledge of projections to express and record the shape and size of the object.	
DEF	Any kind of representation of an object on a paper, screen or similar surface by drawing or by photography is called the projection of that object.	
	If different straight lines are drawn from the various points in correct sequence is called the projection of that object.	

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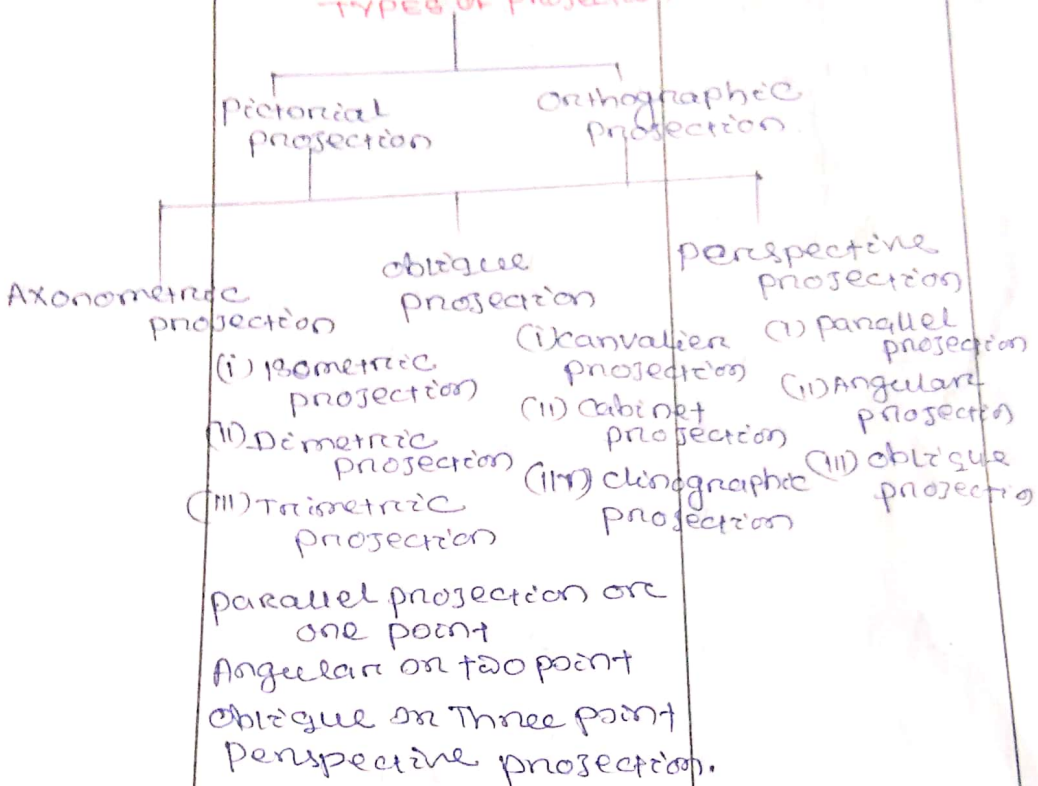
Points/Topics	Narration / information in short	Spot hints/Instructor's guide
TYPES OF PROJECTION	In engineering practice, the following are the common types of projection.	



Parallel projection one point
Angular on two point
Oblique on Three point
Perspective projection.

Summarization: In order to represent the true shape and size of the object. Different straight lone are drawn from the various point on the contour of the object on to the plane of

Application: (1) Deb^n paper. projection
(2) Types of projection.

Test :- (3) Define projection and give the different type of projection.

References :

Next lesson :- Description of Pictorial, oblique Projection.

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Skilled in ODISHA

LESSON PLAN

Trade :- ALL THE TRADE IST YEAR
Name :- BILASINI DAS.

Lesson No :-
Time :-
Date :-

Title :- DESCRIPTION OF PROJECTION.

Objective :- On completion of this lesson the trainees shall be able to :-

(1) What is projection
(2) What are diblerent types of projection.

Preparation/motivation/Introduction :- The study of projections, types of projection, orthographic projection, ways of projection them on drawing etc.

Presentation :-

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
PICTORIAL PROJECTION	The projection has the advantage of conveying an immediate impression of the general shape of the object, but does not necessarey show the exact dimension of the general shape of the object. but does not necessarily the pictorical projection are (a) Axonomatic (b) oblique (c) perspective projection.	
AXONOMETRIC PROJECTION	The projection obtained on a plane of paper when the projectons are perpendicular to the plane and parallel to eachother is known as axonomatic projection.	
ISOMETRIC PROJECTION	The projection obtained on a plane of paper when the projectons are parallel but inclined at angle of 30° to the plane of projection	

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DIMETRIC PROJECTION

TRIMETRIC PROJECTION

OBLIQUE PROJECTION

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LESSON PLAN

Trade : ALL THE TRADE 1ST YEAR
Name : BILASINI DAS

Lesson No :
Time :
Date :

Title : ORTHOGRAPHIC PROJECTION

Objective : On completion of this lesson the trainees shall be able to :

(1) What is projection
(2) Define projection and give the different type of projection.

Preparation/motivation/Introduction : Engineering drawing is the universal graphic language by means of which the shape and size of an object can be specified on a plane of paper.

Presentation

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
Defn	The projection or view obtained on a plane of projection when the projectors are parallel to each other but perpendicular to the plane of projection is known as orthographic projection. While drawing the orthographic projections the following items should invariable exist. (1) The object to be projected (2) The projectors (3) The plane of projections (4) The observer's eye or Station point. The Station point is the point where eye of the observer is located while seeing the object	

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Points/Topics	Narration / Information of short	Spot Demonstration & guide
PLANE OF PROJECTION	The plane which is used for the purpose of projection is called plane of projection.	
REFERENCE PLANE	In general two planes are employed for projection and are known as reference planes or principle planes of projection. These planes intersect at right angle to each other.	
VERTICAL PLANE (V.P)	The plane which is vertical is called vertical plane and is denoted V.P. vertical plane is also known as frontal plane since front view is projected on this plane.	
HORIZONTAL PLANE (H.P)	The plane which is horizontal but at right angle to the V.P is called horizontal plane.	
AUXILIARY PLANE (A.P)	Any other plane placed any angles to the principle planes is called auxiliary plane.	
PROFILE PLANE (P.P)	The plane which is at right angles to the two principle planes is called auxiliary vertical plane (A.V.P) or profile plane (P.P)	

Summarization: The line intersection of two principle planes of projection is called V.P and H.P is called reference or intersection or ground line and is denoted x-y line.

Application: In orthographic projection the lines of sight are ____ to the plane of projection.

Test :- A surface of an object appears in its true shape when it is ____ to the plane of projection.

References :

Next lesson :- TYPES OF ORTHOGRAPHIC PROJ.

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TECHNICAL TRAINING INSTITUTE, TAKATPUR, MAYURBHANJ, ORISSA.

LESSON PLAN

Skilled in ODISHA

Trade - ALL THE TRADE 1ST YEAR Lesson No -

Name - BILASINI DAS Time -

Date -

Title - TYPES OF ORTHOGRAPHIC PROJECTION

Objective - On completion of this lesson the trainees shall be able to -

In the horizontal and vertical planes of projection are assumed to extend beyond the line of intersection the four dihedral angle formed which are designated as first, second, third and fourth angles quadrant.

Preparation/motivation/Introduction - when the projection of an object have been to keep the V.P fixed and to rotate H.P and P.P away from the object so that they object Presentation - so that may come in line with V.P.

Points/Topics	Narration / information in short	Spot hints/Instructor's guide
	The following two types of orthographic projection are used in engineering practice:— (1) First angle projection (2) Third angle projection	
FIRST ANGLE PROJECTION	In this type of projection the object is assumed to be situated the first quadrant. The position of the object can be situated on the H.P and infront V.P. The object lies in between the observer and the plane of projection. View from above (top view) is drawn below of front view. View from below (bottom view) is drawn above of front view. View from left is drawn on the right of front view.	

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Points/Topics	Narration / information in short	Spot hints/Instructor's guide
THIRD ANGLE PROJECTION	View from right (right side view) is drawn on the left of front view. View from the rear (rear view) is drawn on left or right of front view. – The object is assumed to be situated in the third quadrant. → The plane of projection lies in between the observer and the object. → View from views above (top view) is drawn above of front view. → View from below (bottom view) is drawn below of front view. → View from left (left side view) is drawn on the left of front view. → View from right (right side view) is drawn on the left of front view. → View from the rear (rear view) is drawn on right or left of front view.	

Summarization : The standard practices of projection of rotation of planes is to keep the VP, HP and P.P away from the object so that they may come in the path VP.

Application : What is the difference between first angle proj. and third angle proj.

Test :- Explain one view drawings for what type of objects these are used?

References :

Next lesson :-

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