Ramgarhia Polytechnic College, Phagwara

Mechanical Engineering Department

Head of Department:	Er. Gaurav Kumar
Name of the Faculty:	Er.Amanjot singh, Er. Garandeep singh
Discipline:	Mechanical Engineering Department
Semester:	1st
Subject:	ENGINEERING DRAWING-I
Lesson Plan Duration:	16 Weeks

RATIONALE

Drawing is the language of engineers and technicians. Reading and interpreting engineering drawing is their day to day responsibility. The subject is aimed at developing basic graphic skills in the students so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. The emphasis, while imparting instructions, should be to develop conceptual skills in the students following BIS SP 46 – 1988.

Note:

i) First angle projection is to be followed

ii) Minimum of 16 sheets to be prepared and atleast 2 sheets on AutoCAD

iii) Instructions relevant to various drawings may be given along with appropriate demonstrations, before assigning drawing practice to students

Learning Outcomes

After undergoing this course, the students will be able to:

C01. Identify and use of different grades of pencils and other drafting instruments which are used in engineering field

CO2. Draw free hand sketches of various kinds of objects

CO3. Utilize various types of lines used in engineering drawing.

CO4. Read and apply different dimensioning methods on drawing of objects

CO5. Use different types of scales and their utilization in reading and reproducing drawings of objects and maps

CO6. Draw 2 - dimensional view of different objects viewed from different angles (orthographic views)

CO7. Draw and interpret complete inner hidden details of an object which are otherwise not visible in normal view

CO8. Generate isometric (3D) drawing from different 2D (orthographic) views/sketches

CO9. Identify conventions for different engineering materials, symbols, sections of regular objects and general fittings used in Civil and Electrical household appliances

CO10. Use basic commands of AutoCAD.

PO ⇨ / CO ⇩	PO1	PO2	PO3	PO4	PO5	PO6	PO7

CO1							
CO2							
CO3							
CO4							
CO5							
CO6							
CO7							
CO8							
CO9							
CO10							

Syllabus

Units	Details	Sheets
1.	1Introduction to Engineering Drawing 1.1 Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards. 1.2 Different types of lines in Engineering drawing as per BIS specifications 1.3 Practice of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments. 1.4 Free hand and instrumental lettering (Alphabet and numerals) – upper case (Capital Letter), single stroke, vertical and inclined at 75 degree, series of 5,8,12 mm of free hand and instrumental lettering of height 25 to 35 mm in the ratio of 7:4.	(03 sheets)
2.	Dimensioning Technique 2.1 Necessity of dimensioning, method and principles of dimensioning (mainly theoretical instructions) 2.2 Dimensioning of overall sizes, circles, threaded holes, chamfered	(01 sheet)

	surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sunk holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arche	
3.	Scales 3.1 Scales –their needs and importance (theoretical instructions), type of scales, definition of R.F. and length of scale 3.2 Drawing of plain and diagonal scales)	(02 Sheets)
4.	Orthographic Projections 4.1 Theory of orthographic projections (Elaborate theoretical instructions) 4.2 Projection of Points in different quadrant 4.3 Projection of Straight Line (1st and 3rd angle) 4.3.1. Line parallel to both the planes 4.3.2. Line perpendicular to any one of the reference plane 4.3.3. Line inclined to any one of the reference plane. 4.4 Projection of Plane – Different lamina like square, rectangular, triangular and circle inclined to one plane, parallel and perpendicular to another plane in 1st angle only 4.5 Three views of orthographic projection of different objects. (At least one sheet in 3rd angle) 4.6 Identification of surfaces	(06sheets)
5.	Sections 5.1 Importance and salient features 5.2 Drawing of full section, half section, partial or broken out sections, Offset sections, revolved sections and removed sections . 5.3 Convention sectional representation of various materials, conventional breaks for shafts, pipes, rectangular, square, angle, channel, rolled sections 5.4 Orthographic sectional views of different objects.	(02sheets)
6.	Isometric Views 6.1 Fundamentals of isometric projections and isometric scale. 6.2 Isometric views of combination of regular solids like cylinder, cone, cube and prism	(02sheets)
7.	Common Symbols and Conventions used in Engineering 7.1 Civil Engineering sanitary fitting symbols 7.2 Electrical fitting symbols for domestic interior installations	(02 sheets)

8.	Introduction to AutoCAD Basic introduction and operational instructions of various commands in AutoCAD. At least two sheets on AutoCAD of cube, cuboid, cone, pyramid, truncated cone and pyramid, sphere and combination of above solids.	(02 sheets)

Reference Books:

1. A Text Book of Engineering Drawing by Surjit Singh; Dhanpat Rai & Co., Delhi

2. Engineering Drawing by PS Gill; SK Kataria & Sons, New Delhi

3. Elementary Engineering Drawing in First Angle Projection by ND Bhatt; Charotar Publishing House Pvt. Ltd., Anand

4. Engineering Drawing I & II by JS Layall; Eagle Parkashan, Jalandha

r 5. Engineering Drawing I by DK Goel, GBD Publication.

Delivery/Instructional Methodologies

Sr.No.	Description
1.	Chalk and Talk
2.	PowerPoint Presentation

Assessment Methodologies

Sr. No.	Description	Type
1.	Student Assignment	Direct
2.	Test	Direct
3.	Board Examination	Direct
4.	Student Feedback	Direct

Gaps in the syllabus - to meet industry/profession requirements

S.NO.	DESCRIPTION	PROPOSED ACTIONS	PO MAPPING
	N/A	N/A	N/A

Topics beyond syllabus/advanced topics

Units	Details	Hours
N/A	N/A	N/A

Web Source References

Sr. No.	URL
1.	https://nptel.ac.in/

Lesson Plan

Week	Practical		
	Lecture Day	Practical /Sheet	Detail
1st	1st	1	Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards. Different types of lines in Engineering drawing as per BIS specifications
	2nd		

	3rd		
	4th	1	Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards. Different types of lines in Engineering drawing as per BIS specifications
	5th		
	6th		
2nd	7th	1	Practice of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments.
	8th		
	9th		
	10th	1	Free hand and instrumental lettering (Alphabet and numerals) – upper case (Capital Letter), single stroke, vertical and inclined at 75 degree, series of 5,8,12 mm of free hand and instrumental lettering of height 25 to 35 mm in the ratio of 7:4
	11th		
	12th		
3RD	13th	1	Necessity of dimensioning, method and principles of dimensioning (mainly theoretical instructions) Dimensioning of overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sunk holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arche
	14th		
	15th		

	16th	1	Scales –their needs and importance (theoretical instructions), type of scales, definition of R.F. and length of scale
	17th		
	18th		
4th	19nd	1	Drawing of plain and diagonal scales)
	20th		
	21th		
	22nd	1	Theory of orthographic projections (Elaborate theoretical instructions
	23rd		
	24th		
5th	25th	1	Projection of Points in different quadrant
	26th		
	27th		
	28tjh		
	29th		Projection of Straight Line (1st and 3rd angle)

	30th		.1. Line parallel to both the planes .2. Line perpendicular to any one of the reference plane .3. Line inclined to any one of the reference plane.
6th	31st		
	32nd		
	33rd		
	34th		**House test-I**
	35th		
	36th		
7th	37th	1	
	38th		
	39th		
	40th	1	Three views of orthographic projection of different
	41st		

	42nd		objects. (At least one sheet in 3rd angle
8th	43rdth	2	Identification of surfaces
	44th		
	45th		
	46th	1	Sections Importance and salient features Drawing of full section, half section, partial or broken out sections, Offset sections, revolved sections and removed sections
	47th		
	48th		
9th	49th	1	Convention sectional representation of various materials, conventional breaks for shafts, pipes, rectangular, square, angle, channel, rolled sections Orthographic sectional views of different objects
	50th		
	51st		
	52nd	1	Isometric Views Fundamentals of isometric projections and isometric scale
	53rd		
	54th		
	55th		
	56th		

10th	57th	1	Isometric views of combination of regular solids like cylinder, cone, cube and prism
	58th	1	Common Symbols and Conventions used in Engineering Civil Engineering sanitary fitting symbols
	59th		
	60th		
11th	61st	1	Electrical fitting symbols for domestic interior installations
	62nd		
	63rd		
	64th	1	
	65th		
	66th		
12th	67th		**House Test-II**
	68th		
	69st		

	70th		
	71rd		
	72h		
13th	73h	1	Introduction to AutoCAD Basic introduction and operational instructions of various commands in AutoCAD.
	74th		
	75th		
	76th		
	77th		
	78st		
14th	79nd		At least two sheets on AutoCAD of cube, cuboid, cone, pyramid, truncated cone and pyramid, sphere and combination of above solids
	80th		
	81th		
	82th		
	83		
	84		
15th	85		**House Test-III**

	86		
	87		
	88		
	89		
	90		
	91		
	92		
	93		
16th	94		PTM
	95		
	96th		