ENGINEERING DRAWING-I

Course Code: ME 102

Lecturer: 1 **Year: 1**
Tutorial: **Part: 1**
Practical: 3 **Course Credit: 1**

Course Objectives: This course is designed to provide knowledge and skill on points, lines, planes and geometrical solids. To draw projections, drawings of various geometric figures. Also to develop ability of preparing working drawings.

	Teaching Schedule Hours/Week			Evaluation Scheme				
				Internal Evaluation		Final Evaluation		Total
	Lecture	Tutorial	Practical	Theory	Practical	Theory	Practical	100
Cr	1	-	3	-	60	-	40	

Course Contents:

Unit 1. Introduction of Engineering Drawing (2 Hours)

1.1 Types of drawing i. e Engineering drawing and artist drawing and engineering drawing is the universal language of Engineering technical person.
1.2 Introduction of drawing material i.e drawing as drawing paper, drawing board , , adhesive tape, pencil, eraser, sharpener etc.
1.3 Drawing instrument i .e drawing board, drawing paper, T-square, set square, protector, drafting machine, instrument box, scale, french Curves etc.

Unit 2. Lettering (2 Hour)

2.1 Introduction of the single stroke letter and their ratio between height and breadth.
2.2 Introduction of the upper and Lower case letter.

Unit 3. Scale and Dimensioning (4 Hour)

3.1 Introduction of the scale and importance.
3.2 Types of scale (full ,reducing and enlarge)
3.3 Introduction of dimensioning
3.4 Terminology of dimension
3.5 Dimensioning system i.e aligned system unidirectional system and baseline dimensioning.
3.6 Principles of dimensioning.

Unit 4. Applied geometry (10 Hour)

4.1 plane geometrical construction:
Proportional division of line, division of a circle, division of angle, division of triangle,arc and line tangents
4.2 Method for drawing standard curve such as ellipses, parabolas, hyperbolas, involutes, spirals, cycloids and helices.
4.3 Techniques to reproduce a given drawing (by construction)

Unit 5. Basic descriptive geometry (22Hour)

5.1 Introduction to orthographic projection, principle plane ,four quadrant or angle.
5.2 Projection of point on 1st, 2nd, 3rd and 4th quadrants, system of orthographic projection, making of orthographic view, analysis of object and tis view.
5.3 projection of lines: parallel to the one of the principal plane inclined to one of the principal plane and parallel to other, inclined to both principal planes.
5.4 projection of planes: perpendicular to the both principal planes, parallel to one of the principal planes and inclined to one of the principal planes, perpendicular to other and inclined to both principal planes.
5.5 True length of the line: horizontal , inclined and oblique lines.
5.5 Rules for parallel and perpendicular lines.
5.6 Point view or end view of line.
5.7 Edge view and true shape of an oblique planes.
5.8 Angle between two intersecting lines
5.9 Intersection of a line and a plane.
5.10 Angle between a line and a plane.
5.11 Dihedral angle between two planes.
5.12 Shortest distance between the two skew lines.
5.13 Angle between two non-intersecting skew lines.

Unit 6. Multi view (orthographic) projection (20 Hour)

6.1 perspective projection drawing, orthographic projections , Aonometric projection, oblique projection, first and third angle projection.
6.2 principal views: method for obtaining orthographic views, projection of Lines, angle and plane surfaces, analysis in the three view, projection of the curved line and surface, object orientation and selection of the view for representation, Orthographic drawing making an orthographic drawing visualizing object from the given views, interpolation of adjacent area.
6.3 sectional views: full, half, broken revolved, removed (detail) sections, Phantom of hidden sections, axillary sectional views, specifying cutting planes for Sections, conventional for hidden lines, holes,ribs, spokes
6.5 Auxiliary view: Basic concept and use, drawing method and types, symmetrical and unilateral auxiliary views. projection of the curved lines and boundaries, line of intersection between two planes, true size of dihedral angles, true size and shape of plane surfaces.

Practical 3 hour/week: 15 weeks

Sheets:-

1. Drawing sheet layout, freehand lettering, sketching of parallel lines, circles dimensioning.
2. Perform dimensional practicing exercise on aligned,unidirectional,tittle block and base line dimensions.
3. Perform line: bisection, trisection line division any number of parts, with a proportional division, circle division in the three, four, five, six, seven and eight parts, area of triangle and tripezoidd division any number of equal parts.
4. Draw tangent from any point on circle, open and closed line tangent. Arc tangent-internal, external and combined.
5. Ellipse- concentric circle, oblong (rectangle) foci and eccentricity method.

6. Hyperbola-rectangular and t transverse axis method.
7. Parabola-rectangle, offset,transverse axis method.
8. Involutes, spiral construction cycloid, helices.
9. Descriptive geometry -projection of point and lines (sketch and instrumental drawing)
10. Plane of projection- perpendicular to one plane and parallel to the other, perpendicular to the both the planes, perpendicular to one plane and inclined to the others.
11. Solid projection- Orthographic projection of simple geometrical solid in first and third angle projection.
12. Multiview, sectional drawing and dimensioning (sketch and instrumental drawing)
13. Auxiliary view, sectional drawing and dimensioning (sketch and instrumental drawing)
14. Analyze the view and draw orthographic projection of flat, inclined and circular surfaced model of the given objects.

References:

1. Luzzadar W. I Fundamental of Engineering drawing. Prentice-Hall of India
2. S. Bogolyubov and A. Voinov, Engineering drawing. Mir Publishers, Moscow.
3. S. K Bogolyubov, Exercises in Machine Drawing. Mir publishers, Moscow.
4. K. Venugopal Engineering Drawing and Graphics, New age international (p) Ltd. India
5. Gill. P. S. Engineering Drawing, S. K. Kataria and sons India.
6. M. B. Shah and B.C. Rana, Engineering Drawing, Pearson India,
7. N. A and Panchal V.M. Engineering Drawing Charotar D. Bhatt publishing House India.
8. A Text Book of engineering Drawing" R.. K Dhawan , S. Chand and Company Limited.

Evaluation Scheme

The question will be cover all the chapter in the syllabus. The evaluation scheme will be as indicated in the table below:-

Chapter	Hours	Mark distribution
1, 2	4	3 to 5
3	4	3 to 5
4	10	5 to 7
5	22	15
6	20	10
Total	**60**	**40**

- **There may be minor deviation in marks distribution.**