ENGINEERING DRAWING

SYLLABUS FOR HIGHER SECONDARY COURSE

OBJECTIVE:

- **To enable the student to understand and develop clear concept and perception of form, proportion and purpose and connect these to daily life phenomenon.**
- **To enable the student to develop the skill of expressing the two –dimensional and three dimensional objects into professional language and vice- versa.**
- **To enable the student to acquire to readily draw neat sketches often needed in "on-job-situations."**
- **To prepare the student to develop a clear understanding of plane and solid geometry and to some extent machine drawing so as to apply the same in relevant practical fields such as technology and industry.**
- **To enable the student to acquire speed and accuracy in use of drawing instruments.**
- **To equip the student to apply theoretical knowledge of graphics fruitfully in other areas in the future.**

CURRICULUM FOR + 2 STAGES IN SCIENCE & ARTS

Infrastructure:

(a) SPACE: 2m^2 /Student

(b) FURNITURE

- **(i) One Drawing board for each student (700x1000,Thickness=25 mm) of well-seasoned soft wood.**
- **(ii) The black board measuring 1.5m x3 m**
- **(iii) A typical almirah to keep the drawing sheets and other accessories required for drawing**

(c) DRAWING TOOLS FOR STUDENTS

- **(i) T-square**
- **(ii) Set-square (30$^{0/}$ 60^0 & 45^0)**
  - **a) 30^0/60^0/ set square of 25 cm Length**
  - **b) 45^0 set square of 20 cm Length**
- **(Iii) Protector-(Circular on semicircular of 100 mm diameter**
- **(Iv) DRAWING INSTRUMENT BOX, CONTAINING**
  - **a) Large –size compass with inter-changeable pencil and pen legs**
  - **b) Large- size divider**
  - **c) Small bow pencil**
  - **d) Small bow pen**
  - **e) Small bow divider**
  - **f) Lengthening bar**
  - **g) Linking pen**

V. SCALES : Made of wood ,steel celluloid or plastic
15 cm long and 2 cm wide or 30 cm wide fiat scales are in common use

VI. French curve

VII. Drawing paper

VIII. Drawing pencils

IX. Rubber eraser

X. Drawing pins

XI. Small paper block

XII. Duster

SYLLABUS OF ENGINEERING DRAWING FOR HIGHER SECONDARY FIRST YEAR COURSE (THEORY)

One Paper (Theory) Time: Three Hours Marks: 50 Period 90

Unitwise Distribution of Marks and Periods

Unit No.	Title	Marks	Periods
Unit-1	Introduction to drawing instruments		3
Unit-2	Lettering and dimensioning	2	6
Unit-3	Scales	2	6
Unit-4	Construction of Line, angles, rectilinear figures	4	6
Unit-5	Construction of circles, semicircles, tangents	4	6
Unit -6	Construction of ellipse, parabola, involutes Cycloid, helix and Sine curve	4	6
Unit-7	Orthographic projection 3rd angle projection Projection of points, lines planes and solids	16	24
Unit -8	Section of Solid figures	8	12
Unit -9	Development of surfaces	6	12
Unit -10	Visualization	4	9
	Total	**50**	**90**

Unitwise Distribution of Course contents (Theory):

Unit -1 *Introduction* : Drawing as medium of Communication .Handing and use of drawing instruments

Unit-2 *Lettering and dimensioning*: Types, thickness and shades of lettering, Technique of free band single stroke lettering size and location dimensioning.

Unit -3 Scales: Plain diagonal, comparative, vermier, reducing and increasing scales

Unit -4 Construction of lines, angles and their divisions, Construction of triangles, squares, rhombuses, Trapeziums, regular polygon likes pentagon, hexagon and octagon.

Unit-5 Construction of circles, semicircles, external and internal tangents of circles, inscribing circles in equilateral triangle, square, rhombus and regular polygon

Unit-6 Construction of ellipses by-concentric, circles intersecting arcs and intersecting line method. Construction of parabola by intersecting lines and intersecting arc method. Construction of involute of a circle .Construction of cycloid, helix and sine curve.

Unit-7 Methods of orthographic projection and dimensioning strictly as per SP:46-1988 revised convention .Projection of points ,lines, regular plane figures and rightengular solids such as cubes, prism pyramids (square ,triangular, pentagonal and hexagonal) .Tetrahedrons, cones, cylinders ,spheres ,hemispheres ,frustums of solids when they are kept with their axis perpendicular to Horizontal Plane (HP) or Vertical plane (VP) or parallel to one and inclined to the other or parallel to HP and VP both

Unit -8 sections of solids under same conditions mentioned above in Unit -7 made with the HP, VP and inclined Plane also showing the shape of sections

Unit -9 Development of the surfaces of the following solids: Cube, cuboids, prism-square. triangular and hexagonal .Pyramids –square, triangular and hexagonal .

Right circular cylinder and cone.

Unit -10 Visualization Drawing of the third view ,drawing of missing line,skething the pictorial view from the orthographic view and reading of orthographic view .

SYLLABUS FOR ENGINEERING DRAWING PRACTICAL

One Paper (Theory) Time: Three Hours Marks: 50 Period: 90

Unitwise Distribution of Marks and Periods

Unit No.	Title	Marks
Unit-1	The scheme of evaluation	20
Unit -2	Drawing sketch	10
Unit-3	Viva-voce	5
Unit -4	Seasonal assignments	15
	Total	**50**

Unitwise Distribution of Course contents:

Unit-1 Developing prism and pyramids with the help of cardboard or thick paper, Developing different types of packing boxes (Cartons) **(Period 15)**

Unit-2 Making different types of graphics design/murals for exterior or interior decorations using coloured lamina paper incorporating the knowledge of circumscribing inscribing and describing of plane general figures. **(Period 15)**

Unit-3 Drawing ellipse by trammel method and thread method on ground /plywood or drawing sheet **(Period 15)**

Unit -4 Preparing top view (plane) of a classroom, drawing room and home and incorporating different objects in it. **(Period 15)**

Unit -5 Drawing though activities of involutes, cycloid, helix and Sine-curves and listing their uses in daily life. **(Period 15)**

Unit-6 Preparing the following section of solids (prisms,pyramids,sphree etc.)With clay soap thermocol,plasticine ,wax or any other material easily and economically available ,When the cutting plane is **(Period 15)**

(i) Parallel to the base,

(ii) Perpendicular to the base,

(iii) Inclined to the base and

(iv) Cutting as a given height at a given angle above the base

BOOKS RECOMMENDED

1 **Engineering drawing by N.D. Bhatt and V.M Panchal ISBN-81-85594-58-9 Publication: CHAROTAR PUBLISHING HOUSE**

2. **Engineering Graphic, by A.M Chandra and Satish Chandra,Publication, NARORA**

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