

ENGINEERING GRAPHICS

Course Structure

Units	Topics	Marks
Unit I	Plane Geometry	16
1	Lines, angles and rectilinear figures	
2	Circles and tangents	
3	Special curves: ellipse, parabola, involute, cycloid. Helix and Sine-curve	
Unit II	Solid Geometry	27
4	Orthographic-projections of points, lines laminae, (plane) and solids	
5	Section of solid-figures	
Unit III	Machine Drawing	27
6	Orthographic projections of simple machine-blocks	
7	Isometric-projection of laminae (plane) figures	
8	Development of surfaces	
Unit IV	Practical	10
Total		70

Unit I: Plane Geometry

- Printing English alphabets (capital and small) numerals in standard proportions
- Unidirectional/aligned system of dimensioning as per SP: 46-2003 (Revised)

Chapter 1: Lines, angles and rectilinear figures

- Construction of lines
- Angles and their divisions
- Simple questions based on:
 - Triangles
 - Square
 - Rhombus
 - Trapeziums
 - Regular polygons-pentagon
 - Hexagon
 - Octagon

Chapter 2: Circles and tangents

- Construction of circles
- External and internal tangents of circles
- Inscribing
- Circumscribing circles in equilateral triangle
- Square
- Rhombus
- Regular polygons-pentagon
- Hexagon and octagon

Chapter 3: Construction of Engineering curves:

- Ellipses by concentric circles, intersecting arcs and intersecting lines
- Parabola by intersecting lines and intersecting arcs
- Involute of a circle, cycloid, helix and sine curve

Unit II: Solid Geometry

Chapter 4: Orthographic-projections

- Methods of orthographic projections and dimensioning strictly as per SP: 46-2003 revised conventions
- Projection of:
 - Points
 - Lines
 - Regular plane figure
- Projection of right regular solids such as:
 - Cubes
 - Prisms
 - Pyramids (square, triangular, pentagonal and hexagonal)
 - Cones
 - Cylinders
 - Spheres
 - Hemi-spheres
 - Frustum of pyramids and cone when they are kept with their axis:
 - a. Perpendicular, to HP/VP
 - b. Parallel to one plane and inclined to the other
 - c. Parallel to HP and VP both

Chapter 5: Section of solid-figures

- Section of solids under the same conditions mentioned above made by the:
 - Horizontal
 - Vertical
 - Inclined planes (also showing true-shape of section)

Unit III. Machine Drawing

Chapter 6: Orthographic projections of simple machine blocks

Chapter 7: Isometric-projection of laminae (plane) figures

- Construction of isometric scale showing main divisions of 10 mm and smaller divisions of 1 mm each.
- Isometric projection (drawn to isometric scale) of figures such as:
 - Triangles
 - Squares
 - Pentagons
 - Hexagons
 - Circles
 - Semi-circles (with their surface parallel to HP or VP and its one side or diagonal or diameter should be either parallel or perpendicular to HP/VP)

Chapter 8: Development of surfaces

- Cube
 - Cuboid
 - Prisms-triangular
 - Square
 - Pentagonal
 - Hexagonal
- Pyramids:
 - Triangular
 - Square
 - Pentagonal
 - Hexagonal
- Right circular cylinder and cone

Unit IV: Practical

- Developing "Prisms" and "Pyramids" with the help of card board (thick paper)
- Developing different types of packing boxes (cartons)
- Making different types of graphic designs/murals for interior/exterior decorations in colour using the knowledge of geometrical figures with the use of any Computer Software such as:
 - Collab-CAD
 - CORAL DRAW
 - PHOTOSHOP, etc.
- Drawing ellipse by Trammel and Thread method on the ground / drawing sheet / plywood / cardboard, etc.
- Preparing top-view (plan) of a class room, Home:
 - Drawing room / Bedroom / Study room / Kitchen
 - Engineering Graphics room
 - Drawing different objects kept in rooms
- Drawing through activities:
 - Involute
 - Cycloid
 - Helix
 - Sine curves (listing their uses in daily life)
- Preparing the following sections of solids (prisms, pyramids, spheres, etc.) with clay, soap, thermocol, plasticine, wax or any other material easily and economically available. When the cutting plane is: parallel to the base, perpendicular to the base and inclined to the base. Also creating different objects with combination of above solids.