CBSE Syllabus

Class XI

ENGINEERING GRAPHICS

# tutorialspoint
## SIMPLY EASY LEARNING

# 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:
  - Involutes
  - 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.