

# ARCHITECTURAL GRAPHICS I

ENAR 104

**Lecture** : 2  
**Tutorial** : 0  
**Practical** : 4

**Year** : I  
**Part** : I

## **Course Objectives:**

To provide students a sound knowledge of architectural graphics with the use of graphical instruments and introduce drawings by the exercises through the concepts and principles of orthographic, parallel and perspective projection to develop architectural graphic techniques to apply them for relevant topics. Also to introduce the fundamental of architectural techniques in architectural graphics and understanding as a means of visual communication.

## **1 Preliminary Graphics Skill**

**(6 hours)**

- 1.1 Introduction of drawing and its classification
- 1.2 Drafting equipment and their uses
- 1.3 Line exercises
  - 1.3.1 Hatching lines
  - 1.3.2 Line pattern
  - 1.3.3 Formation of line
- 1.4 Conventional building drawing symbols
- 1.5 Technical lettering and its types
- 1.6 Scale and dimensioning, its types and system
- 1.7 Geometry
  - 1.7.1 Introduction
  - 1.7.2 Geometrical construction: Geometrical exercises on lines, triangles, polygons and necessary geometric constructions, etc.

## **2 Theory of Projection**

**(4 hours)**

- 2.1 Introduction and types of projection
  - 2.1.1 Parallel and conical projection
    - 2.1.1.1 Axonometric projection
    - 2.1.1.2 Oblique projection
    - 2.1.1.3 Isometric projection
    - 2.1.1.4 Orthographic projection
    - 2.1.1.5 Perspective projection

- 3 Orthographic Projection (2D Drawings) (4 hours)**
- 3.1 Introduction
  - 3.2 System of 3 planes
  - 3.3 Principle of orthographic projection
  - 3.4 Projection of points, line and plane in different reference planes
    - 3.4.1 First angle projection
    - 3.4.2 Third angle projection
- 4 Isometric Projection (1 hours)**
- 4.1 Isometric scale
  - 4.2 Isometric axes
    - 4.2.1 Non Isometric axes
    - 4.2.2 Isometric lines and planes
- 5 Conversion of 3D into 2D and 2D into 3D (1 hours)**
- 5.1 Conversion of isometric views into orthographic drawings
  - 5.2 Conversion of orthographic view into isometric drawings
- 6 Other Graphical Views, Sections and Intersection of Surfaces (4 hours)**
- 6.1 Sectional views and its types
  - 6.2 Conic section and engineering curves
  - 6.3 Section of solids
  - 6.4 Intersection of surfaces and interpenetration and its methods of projection
  - 6.5 Development of surfaces and its methods of projection
  - 6.6 Miscellaneous graphical drawings
- 7 Building drawings (2 hours)**
- 7.1 Building anatomy and its terminologies
  - 7.2 Staircase section
  - 7.3 Wall section
  - 7.4 Door window details
  - 7.5 Types of roof
- 8 Perspective Projection (8 hours)**
- 8.1 Introduction, perspective terms
  - 8.2 Types of perspective: One point, two point and three point
  - 8.3 Views of perspective projection: Normal eye view, worm's eye view and bird's eye view
  - 8.4 Principles of perspective views, its importance and use

- 8.5 Difference between perspective and isometric views
- 8.6 Different exercises in perspective projection from geometrical and architectural drawings
- 8.7 Application of perspective projection in architectural drawings

## **Practical**

**(60 hours)**

1. Name plate with border line
2. Line exercises: Hatching lines, line pattern, formation of lines
3. Conventional building drawing symbols: Convention for lines, materials and textures
4. Technical lettering and its types: Different types of lettering on proportional base
5. Scale and dimensioning, its types and system: Exercises on different scales and system of dimensions of geometrical figures
6. Geometric construction: Exercises on geometrical construction of point, line bisection, perpendicular line, parallel line, trisection of line, bisection and trisection of angle etc.
7. Exercises on inscribing and describing of circle about a triangle, square and polygon etc.
8. Exercises on construction of square, different types of polygons, external and internal tangents, arc tangents, special curves, conical sections and other geometrical constructions if needed
9. Theory of projection: Parallel and conical projection with sketches of axonometric projection, oblique projection, isometric projection, orthographic projection, perspective projection etc. (Tree chart)
10. Orthographic projection: Exercises on orthographic and pictorial planes in 1st and 3rd angle projection
11. Projection of points, line and plane in different reference planes
12. Exercises on orthographic and pictorial projection of solid figures
13. Exercises on orthographic projection of point and lines on the surface of solid figures
14. Exercises on orthographic projection of three dimensional figures in 1st and 3rd angle projection (Conversion of isometric drawing into orthographic projection: Soap model)
15. Exercises on Isometric Projection:
  - 16. - Conversion of isometric views into orthographic drawings
  - 17. - Conversion of orthographic view into isometric drawings
18. Other graphical views, sections and intersection of surfaces
19. Exercises on auxiliary types of view
20. Exercises on sectional type of view
21. Exercises on orthographic projection of different types of section of geometric solids

22. Exercise on orthographic projection of intersection or interpenetration of different solids (Prism by prism, cylinder by cylinder, cone by cylinder, cone by prism and others if needed)
23. Exercises on development of surfaces of different solids (Cube, prism, cylinder, cone, pyramid, sphere and other if needed)
24. Building drawings: Exercise of building drawing of one and half storied building with staircase
25. - Floor plans, elevations, sections and detailing
26. - Staircase detail section, wall section, door window details and types of roof etc.
27. - 3D (Isometric) views of one storied building
28. Perspective drawings
29. Introductory perspective view: One point, two point (Exterior and interior views)
30. Combined two blocks perspective
31. Combined three blocks perspective
32. Perspective view of one room building
33. Interior perspective view of a room
34. Further exercises on exterior buildings
35. Miscellaneous graphical drawings

## Reference

1. Bhatt, N. D., Panchal, V. M. (2021). Engineering drawing: Plane & solid geometry (58th ed.). Anand, India: Charotar Publishing House.
2. Ching, F. D. K. (2023). Architectural graphics (7th ed.). Hoboken, NJ: Wiley.
3. Dhawan, R. K. (2019). A textbook of engineering drawing. New Delhi, India: S. Chand Publishing.
4. French, T. E., Vierck, C. J., & Foster, R. J. (1978). Engineering drawing and graphic technology (12th ed.). New York, NY: McGraw-Hill.
5. Giesecke, F. E., Mitchell, A., Novak, J. E., Dygdon, J. T., Lockhart, S., Johnson, C. M., Hill, I. L. (2021). Technical drawing with engineering graphics (15th ed.). Hoboken, NJ: Pearson.
6. Luzadder, W. J., Duff, J. M. (1989). Fundamentals of engineering drawing: With an introduction to interactive computer graphics for design and production (10th ed.). Englewood Cliffs, NJ: Prentice Hall.
7. Venugopal, K. (2024). Engineering drawing & graphics (17th ed.). New Delhi, India: New Age International.