

Introduction to Descriptive Geometry

Importance in Architecture | Basic
Terminology | Projection Systems
Overview

What is Descriptive Geometry?

- Descriptive Geometry is a branch of mathematics that allows the representation of three-dimensional objects in two dimensions.
- - Essential for architectural design
- - Used in technical drawings and visualization
- - Foundation for digital modeling and parametric design

Importance of Descriptive Geometry in Architecture

- - Helps in visualizing and constructing architectural forms
- - Essential for technical drawing and CAD applications
- - Allows precise measurement and representation of complex structures
- - Used in urban planning, landscape architecture, and interior design

Basic Terminology: Point, Line, and Plane

- - Point: A single location in space without dimension
- - Line: A straight connection between two points
- - Plane: A flat surface extending infinitely in two dimensions
- - Intersection: Where two geometrical entities meet

Basic Terminology: Solids and Volume

- - Solid: A 3D object enclosed by surfaces
- - Volume: The amount of space an object occupies
- - Examples: Cube, Cylinder, Pyramid, Sphere

Projection Systems Overview

- Projection is a technique to represent a 3D object on a 2D plane.
- - Orthographic Projection
- - Axonometric Projection
- - Perspective Projection

Orthographic Projection

- - Uses multiple views (top, front, side) to represent an object
- - No perspective distortion, used in technical drawings
- - Commonly used in architectural floor plans and elevations

Axonometric Projection

- - Represents a 3D object in a 2D drawing with scale preserved
- - Types: Isometric, Dimetric, and Trimetric
- - Used in architectural drawings and 3D modeling

Perspective Projection

- - Creates a realistic 3D view by using vanishing points
- - Types: One-point, Two-point, Three-point perspective
- - Used in visual representation and architectural visualization

Applications in Architecture

- - Used in building plans, sections, elevations
- - Helps architects communicate design intent clearly
- - Essential for digital modeling (CAD, Rhino, Grasshopper)
- - Used in parametric and computational design

Advanced Applications of Descriptive Geometry

- - Computational design and parametric modeling
- - Used in complex geometric forms (Zaha Hadid's buildings)
- - Essential in fabrication and construction

Summary and Conclusion

- - Descriptive Geometry is fundamental in architectural design
- - Helps in visualizing and representing complex structures
- - Forms the basis for technical drawing, CAD, and 3D modeling
- - Mastering projection systems is essential for architects