

Computer Graphics
CS-604B
Contact: 3L
Credits: 3

Graphics display devices, Input devices, Rendering pipeline: [2L]

Mathematical concepts: [4L]

Lines and line representations, Vector and affine spaces, Polygons and polygon interiors, Dot and cross products, Planes and plane representations, Line-line and line-plane intersections, Homogeneous coordinates Raster graphics, windowing and clipping: [4L]

Line and Circle drawing algorithms, Windowing, Clipping: Cohen and Sutherland line clipping, Newman and Sproull, Cyrus-beck clipping method Transformations: [6L]

2D and 3D Geometrical Transformations – scaling, translation, rotation, shear, Viewing Transformations: parallel and perspective projection, Affine transformation Viewing: [4L]

Orthographic viewing, Foley VanDam perspective, Mathematics of perspective, Projection taxonomy Curves and surfaces: [4L]

Cubic splines, Bezier curves, B-splines, Tensor product surfaces, Surface of revolution Sweep surfaces, Fractal curves and surfaces Hidden Line/surface elimination [2L]

Scan Conversion: [3L]

DDA, Bresenham, Polygon scan conversion, Antialiasing Illumination and Shading Models: [2L]

Polygon Shading: Gouraud, Phong Introduction to Ray-tracing: [3L]

Human vision and color, Lighting, Reflection and transmission models Animation [2L]

Books:

1. *Computer Graphics (Principles and Practice)* by Foley, van Dam, Feiner and Hughes, Addison Wesley (Indian Edition)
2. *Computer Graphics* by D Hearn and P M Baker, Prentice Hall of India
3. *Mathematical Elements for Computer Graphics* by D F Rogers, McGraw Hill
4. *Procedural Elements for Computer Graphics* by D F Rogers, McGraw Hill