

**Course No: MCA – 3T3**  
**Course Title: Computer Graphics**

**Unit I**

Introduction to Computer Graphics.Applications and Relevance of Computer Graphics. Representing and Preparing pictures for presentation, Displaying Prepared Pictures, Interacting with the pictures. Graphics Display devices. Graphic Display Devices\_ Raster, Refresh, Random. Display Processor, Display Buffer, Concept of Double Buffering and Segmentation of Display Buffer.Display of Dynamic Motion.Color Display Shadow Masking and Beam Penetration, Use of Lookup tables. Laser-Scan and Plasma Panel display. Graphics Input Devices\_ Description and Applications. Graphics Input Techniques, Positioning Techniques & Constraints, Rubber Band Techniques, Dragging, Inking & Painting, Pointing and Selection, Positioning Text. Graphic Kernel System, Introduction to GKS, GKS primitives.

**Unit II**

2-D Graphics.Cartesian and Homogeneous Coordinate Systems.Line drawing algorithms (Bressenhams and DDA).Circle and Ellipse Drawing Algorithms.2-Dimensional Transformations.Clipping. Concepts of Window& Viewport, Window to Viewport Transformations. Clipping Algorithms, Line Clipping (Cohen-Sutherland Algorithm, Liang Barsky Algorithm), Area Clipping/Polygon Clipping. Text Clipping.Filling, Boundary and Floodfill algorithms.

**Unit III:**

3-D Graphics, Projections: perspective and parallel projection transformations. 3-Dimensional Transformations.Hidden Surface Removal Techniques, Z-Buffer Algorithm, Back Face Detection. Scan Line Algorithm, Area-Coherence Algorithm.

**Unit IV**

Curves and Surfaces, Splines, Spline specification, Interpolated & Approximated Splines. Bezier Splines, Bezier Curves, Cubic Bezier Curves, Bezier Surfaces. B-Splines curves and surfaces.Fractals - Fractal Generation Procedure.

Text Book : Hearn and Baker “ Computer Graphics” 2<sup>nd</sup> Edition , Pearson Education.

**Reference Books**

1. W.M.Newman and Sproull. “Principles of interactive Computer Graphics” ,TMH
- 2.Steven Harrington.” Computer Graphics a Programming Approach” McGraw Hill.
3. Plastock and Kelley. “Schaums outline of theory and problems of computer Graphics”
4. David F Frogers and J Alan Adams. “Procedural Elements of Computer Graphics” McGraw Hill
5. David F Rogers and J Alan Adams. “Mathematical Elements of Computer Graphics” McGraw Hill
6. James. D. Foley, AVandametal “Computer Graphics” Pearson.