



CS 513

ADVANCED COMPUTER GRAPHICS

UNIT-I

Raster Graphics System and its Working, Line-Drawing Algorithms (DDA and Bresenham's algorithms), Polygon Filling, 2-D Transformations.

UNIT-II

Fundamentals of 3-D graphics: Projections - Parallel projection and perspective projection, 3-D Transformations, Bezier curves and B-spline curves.

Visible-Surface Detection Methods - Painter's algorithm and Z-buffer method

UNIT-III

Animation: Design of Animation Sequences, General Computer - Animation functions, Raster Animations, Computer-Animation Languages, Key-Frame Systems.

Morphing, Simulating Accelerations, Motion Specification, Direct Motion Specification, Goal Directed Systems, Kinematics and Dynamics.

UNIT -IV

Fractals: Fractal-Geometry Methods, Fractal-Generation Procedures, Classification of Fractals Fractal Dimension, Geometric Construction of Deterministic Self-Similar Fractals, Geometric Construction of Statistically Self-Similar Fractals.

Affine Fractal - Construction methods, Random Midpoint - Displacement Methods. Controlling Terrain Topography, Self-squaring Fractals, Self-Inverse Fractals.

UNIT-V

Advanced Raster Graphics Architecture:

Display - Processor Systems Standard Graphics Pipeline, Introduction to multiprocessing,

Pipelin Front-End Architectures,

Parallel Front-End. Architectures. Multiprocessor Rasterization Architectures, Image-Parallel Rasterization, Object-Parallel Rasterization, Hybrid-Parallel Rasterization, Enhanced Display Capabilities.

Suggested Reading:

1. Ham Donald, Pauline Baker M., "Computer Graphics", 2nd Edition, Pearson Education 1997.
2. Foley, Vandam, Feiner, Hughes, "Computer Graphics - Principles & Practice", 2nd Edition, Addison- Wesley, 1996.
3. David F Rogers, "Procedural Elements for Computer Graphics", 2nd Edition, McGraw-2001.