

COMPUTER GRAPHICS

OBJECTIVES:

- To develop, design and implement two and three dimensional graphical structures
- To enable students to acquire knowledge Multimedia compression and animations
- To learn Creation, Management and Transmission of Multimedia objects.

UNIT-I:

2D Primitives Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives – Two dimensional Geometric transformations - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms

UNIT-II:

3D Concepts Parallel and Perspective projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces, - Visualization of data sets - 3D transformations – Viewing -Visible surface identification.

UNIT-III:

Graphics Programming Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Keyframe - Graphics programming using OpenGL – Basic graphics primitives –Drawing three dimensional objects - Drawing three dimensional scenes

UNIT- IV:

Rendering Introduction to Shading models – Flat and Smooth shading – Adding texture to faces –Adding shadows of objects – Building a camera in a program – Creating shaded objects– Rendering texture – Drawing Shadows.

UNIT- V:

Fractals Fractals and Self similarity – Peano curves – Creating image by iterated functions – Mandelbrot sets – Julia Sets – Random Fractals

UNIT- VI:

Overview of Ray Tracing Intersecting rays with other primitives – Adding Surface texture – Reflections and Transparency – Boolean operations on Objects.

OUTCOMES:

- Know and be able to describe the general software architecture of programs that use 3D computer graphics.
- Know and be able to discuss hardware system architecture for computer graphics. This Includes, but is not limited to: graphics pipeline, frame buffers, and graphic accelerators/co-processors.
- Know and be able to select among models for lighting/shading: Color, ambient light; distant and light with sources; Phong reflection model; and shading (flat, smooth, Gourand, Phong).

TEXT BOOKS:

1. Donald Hearn, Pauline Baker, Computer Graphics – C Version, second edition Pearson Education, 2004.
2. F.S. Hill, Computer Graphics using OPENGL, Second edition, Pearson Education, 2003.

REFERENCE BOOKS:

1. James D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, Computer Graphics- Principles and practice, Second Edition in C, Pearson Education, 2007.