II Year II Semester L T P C
Code:20CS4615 3 0 0 3

COMPUTER GRAPHICS (Honors)

Course Objectives:

The objectives of studying of Computer Graphics are as follows

- 1. To develop, design, and implement two dimensional graphical structures
- 2. To enable the students to acquire knowledge about the 2D and 3D operations
- 3. To enable to students to acquire knowledge about different color model
- 4. To enable students to acquire knowledge multimedia compression and animation
- 5. To learn creation, management and transmission of multimedia objects

Course Outcomes:

Upon the completion of the course the students will learn

- 1. To draw the basic elements of graphics and fill any area primitive
- 2. To develop, design and implement two dimensional transformation, viewing and clipping techniques
- 3. Explain about 3D objects and transformations
- 4. Explain basic illumination and color model, apply them using graphics programming OPENGL
- 5. To understand about the fractals and its types

Unit – I

Output primitives: Computer Graphics, types and application, video display unit, CRT, Vector scan, Raster scan technique, points and lines, Line drawing algorithm (DDA and Bresenham's line derivation and algorithms), mid-point circle drawing algorithm, mid-point ellipse drawing algorithm.

Filled area primitives: inside – outside test, boundary fill and flood-fill algorithm, Scan line polygon fill algorithm

Unit – II

2D geometrical transforms Translation, scaling, rotation, reflection and shear transformations, composite transforms, transformations between coordinate systems.

2D viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport Coordinate transformation, Cohen-Sutherland and Cyrus-beck line Clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

Unit -III

3D concept: Parallel and Projective Projection, Three-dimensional object representation: Polygon, Plane, Polygon mesh, Spline, Bezier curve, B-spline curve, 3 D transformation, viewing, visible surface identification

Unit-IV

Graphics programming: light source illumination, different illumination model, color model – RGB, YIQ, CMY, HSV, Animation – General Computer Animation, raster, morphing, Graphics programming using OPENGL – Basic Graphics primitives – drawing three dimensional objects – drawing three dimensional scene

Unit - V

Fractals: fractals and self-similarity, Peano curve, creating images by iterated function, Mandelbrot sets, Julia sets, Random Fractals

Text Books:

- 1. Donald Hearn, Pauline Barker, 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. Huges, Computer Graphics-Principles and Practices, Second Edition in C, Pearson Education, 2007.