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.