



# SCHEME AND SYLLABUS - B.E. COMPUTER ENGINEERING



Course Code	Type	Subject	L	T	P	Credits	CA	MS	ES	CA	ES	Pre-requisites
CEC12	CC	Computer Graphics	3	0	2	4	15	15	40	15	15	None

## COURSE OUTCOMES

1. To understand the underlying mathematics for output primitives and to incorporate with programming in drawing those primitive.
2. To use graphics primitives in drawing real life objects and to learn how to incorporate characteristics such as shading and animation.
3. To work in collaboration to carry out graphic projects.

## COURSE CONTENT

**Introduction to computer graphics:** Raster Graphics, Graphics hardware, Graphics Libraries and an overview of any one of them such as OpenGL.

**Scan Conversion:** Line DDA, Midpoint and Bresenham's algorithms, circle, ellipse, parabola, hyperbola.

**Line Clipping:** Cohen Sutherland, Cyrus Beck, Midpoint Subdivision, Liang-Barsky, Nicholl-Lee-Nicholl

**Polygon clipping:** Sutherland Hodgman, Weiler Atherton

**Polygon Filling:** Seed fill, Scanline Approach

**Anti-Aliasing:** Un-Weighted and Weighted Area Sampling, Gupta-Sproull Algorithm for Anti-Aliasing

**Transformation:** 2D Transformation - Geometrical Transformation, Homogeneous Coordinates, Window to View port Transformation, Translation, Scaling and Rotation, 3D Transformation - Translation, Scaling and Rotation in 3D

**Projection:** Perspective and Parallel Projection

**3 D Viewing:** Three dimensional Modeling

**Visible Surface Detection (Hidden Surface Elimination):** Z-Buffer, Painter Algorithm, Back face Detection, Area subdivision Method, BSP Tree, Octree

**Curves and Surfaces:** Parametric Cubic Curves, Uniform and Non Uniform Rational B-Spline, Hermite Curve, Bezier Curve, Quadratic Surfaces

**Illumination Models:** Gouraud and Phong Shading Model, Color Model