Computer Graphics

Course Code	20CS4601D	Year	III	Semester	II
Course Category	PEC	Branch	CSE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	-
Continuous Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Understand graphics applications, architectures and openGL program structure	L2
CO2	Apply openGL functions to design interactive programs	L3
CO3	Apply basic transformations on objects	L3
CO4	Apply line and polygon clipping algorithms	L3

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2										1			3	
CO3	3									1				
CO4	2								1	1				

Syllabus		Mapped CO
Unit No.	Contents	
I	Introduction: Applications of computer graphics; A graphics system; Images: Physical and synthetic; Imaging systems; the synthetic camera model; the programmer's interface; Graphics architectures. Graphics Programming: The Sierpinski gasket; Programming two- dimensional applications. The OpenGL API; Primitives and attributes; Color; Viewing; Control functions; The Gasket program.	CO1,CO2
II	Input and Interaction: Interaction; Input devices; Clients and servers; Display lists; Display lists and modeling; Programming event-driven input; Menus; Picking; Animating interactive programs; Logic operations.	CO1,CO2
III	Geometric Objects and Transformations: Scalars, points, and vectors; Three-dimensional primitives; Coordinate systems and frames; Modeling a colored cube; Affine transformations; Rotation, translation and scaling. Transformations in homogeneous coordinates; Concatenation of transformations; OpenGL transformation matrices.	CO1, CO3
IV	Viewing: Classical and computer viewing; Viewing with a computer; Positioning of the camera; Simple projections; Projections in OpenGL; Parallel-projection matrices; Perspective projection matrices.	CO1,CO3
V	Implementation: Basic implementation strategies; Clipping; Cohen-Sutherland Line-segment clipping; Polygon clipping; Clipping of other primitives; Clipping in three dimensions; Rasterization; Bresenham's algorithm; Polygon rasterization;	CO1,CO4

Learning Resources
Text Books
1. Interactive Computer Graphics A Top-Down Approach with OpenGL, Edward Angel, 5th Edition, Pearson, 2009.   2. Computer Graphics through OpenGL: From Theory to Experiments, Sumantha Guha, Chapman and Hall/CRC, 2011 (For OpenGL and related examples).
References
1. Computer Graphics with OpenGL, Hearn & Baker, 3rd Edition, Pearson 2004.   2. Computer Graphics Using OpenGL, F.S. Hill, Jr, and M. Kelley, Jr., 3rd Edition, Pearson/PHI, 2009.