

SN	Week*	Domain	Topics to be covered	Synchronous Mode (Live Session)	Asynchronous mode (Voice over PPTs)	Course Outcome (CO)	Assessment
1	1	Computer Graphics overview and Graphics hardware and essentials	Computer Graphics overview and applications	BlackBoard Collab		CO1	
2			Pixels, RGB color model	BlackBoard Collab		CO1	
3			Raster and Random scan displays, Frame buffer concept		VPPT/Video	CO1	
4			Input and output devices, Displays	BlackBoard Collab		CO1	
5	2	Scan Conversion of atomic primitives and Region filling		BlackBoard Collab		CO1	Reflection 01
6			Scan converting points and lines; DDA	BlackBoard Collab		CO2	
7	3		Scan conversion of lines; Bresenham's algorithm	BlackBoard Collab		CO2	
8			Scan conversion of circles; Bresenham's algorithm	BlackBoard Collab		CO2	
9		2D Transformation and 2D viewing	Scan conversion of ellipses		VPPT/Video	CO2	
10	4		Polyfill scan conversion of the polygons; Flood-fill algorithm	BlackBoard Collab		CO2	
11			Boundary fill	BlackBoard Collab		CO2	
12			Scan-line algorithm	BlackBoard Collab	VPPT/Video	CO2	
13	5	2D Transformation and 2D viewing		BlackBoard Collab		CO2	Ref.2,Quiz01
14			Elementary transformations; translation, rotation, scaling	BlackBoard Collab		CO3	
15			Composition Transformations - I; homogeneous coordinate system, rotation about a point and reflection about a line	BlackBoard Collab		CO3	
16	6		Composite Transformations - II, reflection and shear	BlackBoard Collab		CO3	
17		2D Transformation and 2D viewing	Concept of window and viewport, mapping	BlackBoard Collab		CO3	
18			Point and line clipping; Cohen-Sutherland line clipping		VPPT/Video	CO3	
19	7		Liang-Barskey line clipping			CO3	
20			Sutherland-Hodgman and Weiler-Autherton polygon clipping	BlackBoard Collab		CO3	
21		3D Transformations		BlackBoard Collab		CO3	Reflection 03
22	8		3D transformations; Translation, Rotation, Scaling, instance	BlackBoard Collab		CO3	
23			Rotation about arbitrary axis	BlackBoard Collab		CO3	
24			Reflection through an arbitrary plane		VPPT/Video	CO3	MID SEM
25	9	Projection	Projection; meaning, types	BlackBoard Collab	VPPT/Video	CO3	

26		Modeling Solids	Solid Modeling - I	BlackBoard Collab		CO3	
27			Solid Modeling - II	BlackBoard Collab		CO3	
28	10	Scan converting curves	Curve representation; non-parametric curves	BlackBoard Collab		CO4	
29			conic sections, cubic splines	BlackBoard Collab		CO4	
30			Bezier Curves	BlackBoard Collab	VPPT/Video	CO4	
31	11		Bezier Curves	BlackBoard Collab		CO4	
32			Bspline Curves	BlackBoard Collab		CO4	
33			Bspline Curves, Bezier and Bspline surfaces		VPPT/Video	CO4	
34	12			BlackBoard Collab		CO4	Ref.4,Quiz2
35		Visible surface detection	Hiding invisible surfaces, depth comparison	BlackBoard Collab		CO5	
36			Back face detection	BlackBoard Collab		CO4	
37	13		Z-Buffer algorithm	BlackBoard Collab		CO5	
38			Painter's algorithm	BlackBoard Collab	VPPT/Video	CO5	
39			Ray Tracing in VSD	BlackBoard Collab		CO5	
40	14	Illumination, shading, and advanced rendering	Illumination models, combining light components	BlackBoard Collab		CO5	CLASS TEST
41			combining light components, Phong illumination model	BlackBoard Collab		CO5	
42			Gouraud shading and Phong shading		VPPT/Video	CO5	
43	15		Advanced rendering; Ray Casting	BlackBoard Collab		CO5	
44			Radiosity	BlackBoard Collab		CO5	
45				BlackBoard Collab		CO5	Reflection 05

[1] Hearn, D. and Baker, M.P., 2004. *Computer graphics with OpenGL* . Upper Saddle River, NJ: Pearson Prentice Hall.

[2] Foley, Van, Van Dam, et al., 1996. *Computer graphics: principles and practice* , Addison-Wesley Professional.

[3] David F. Rogers and J. Alan Adams, *Mathematical Elements for Computer Graphics* , McGraw-Hill, Inc.

Not in the syllabus. An introduction shall be given