

PESIT Bangalore South Campus

10CS65: COMPUTER GRAPHICS AND VISUALIZATION

Faculty: Mr.Srikanth/Archana Mathur

No. of hours Specified: 65

The main objective of this course is to give the student a comprehensive understanding of computer graphics and visualisation and their applications.

Session No.	Chapter Title/Reference Literature	Topics to be covered	Percentage of portion covered	
			Reference Chapter	Cumulative
1.	PART-A UNIT#1 INTRODUCTION	Applications of computer graphics; a graphics system;	13.5%	13.5%
2.		Images: Physical and synthetic; Imaging systems;		
3.		The synthetic camera model		
4.		The programmers interface; Graphics architectures;		
5.		Programmable pipelines; Performance characteristics;		
6.		Graphics Programming:		
7.		The sierpinski gasket;		
8.		Programming two dimensional applications.		
9.		Solve Example problems		
10.	UNIT #2 THE OPENGL	The OpenGL API;	11.5%	25%
11.		Primitives and Attributes; Color:		
12.		Viewing; Control functions;		
13.		The Gasket program;		
14.		Polygons and recursion;		
15.		The three-dimensional gasket;		
16.		Plotting implicit functions.		
17.	Solve Example problems			
18.	UNIT #3 INPUT AND INTERACTION	Interaction; Input devices; client and servers;	13.5%	38.5%
19.		Display lists;		
20.		Programming event-driven input;		
21.		Menus Picking; A simple CAD program;		
22.		Building interactive models;		
23.		Animating interactive programs;		
24.	Display lists and modeling;			

25.		design of interactive programs;		
26.		Logic operations		
27.		Solve Example problems		
28.	UNIT #4 GEOMETRIC OBJECTS AND TRANSFORMATIONS - I	Scalars, Points and Vectors;		
29.		Three dimensional primitives;		
30.		Coordinate systems and frames;		
31.		Modeling a colored cube;		
32.		Affine transformations;		
33.		Rotation, translation and scaling.		
34.	<u>PART-B</u> UNIT #5 GEOMETRIC OBJECTS AND TRANSFORMATION S - II	Transformations in homogeneous coordinates;	9.6%	59.6%
35.		Concatenation of transformations;		
36.		OpenGL transformation matrices;		
37.		Interfaces to three dimensional applications;		
38.		Quaternions.		
39.	UNIT #6 VIEWING	Classical and computer viewing; viewing with a computer;		
40.		Positioning of the camera;		
41.		simple projections		
42.		Projections in openGL;		
43.		Hidden surface removal		
44.		Interactive mesh displays;		
45.		Parallel-projection matrices;		
46.				
47.		Perspective-projection matrices; Projection and shadows.		
48.	UNIT #7 LIGHTING AND SHADING	Light and matter; Light sources; The Phong lighting model;	11.5%	84.5%
49.		Computation of vectors;		
50.		Approximation of a sphere by recursive subdivisions;		
52.		Light sources in openGL;		
53.		Specification of materials in OpenGL;		
54.		Shading of the sphere model;		
55.		Polygonal shading;		
56.		Global illumination.		
57.	UNIT #8 IMPLEMENTATION	Basic implementation strategies; The major tasks;		
58.		Clipping; Line-segment clipping;		
59.		Polygon clipping; clipping of other primitives;		
60.		Clipping in three dimensions;		

61		Rasterization;		
62		Polygon rasterization;		
63		Hidden surface removal; Antialiasing;		
64		Display considerations.		
65		Bresenham's algorithm;		

Book Type	Code	Title & Author	Publication Info		
			Edition	Publisher	year
Text Books	T1	Edward Angel : Interactive Computer Graphics A top down approach with OpenGL,	5 T H	Addison Wesley	2008
Reference Books	R1	Computer graphics using OpenGL : F.S.Hill,Jr	2 n d	Pearson education	2001
	R2	Computer graphics: James D Foley, Andries Van Dam, Steven K Feiner, John F Hughes	- -	Addison Wesley	1997
	R3	Computer graphics – OpenGL Version: Donald Hearn and Pauline Baker	2 n d	Pearson education	2003