



C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF:- Computer Science

DEPARTMENT OF:- Master of Computer Applications

SEMESTER:- IV

CODE:- 5CS04MCG1

NAME – COMPUTER GRAPHICS (CG) - (MAJOR ELLECTIVE – I)

Teaching and Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
5CS04MCG1	COMPUTER GRAPHICS (CG)	4	0	2	6	5	30	1.5	70	3	10	---	40	150

Objectives:

- To know and be able to describe the general software architecture of programs that use 2D computer graphics.
- Know and be able to discuss hardware system architecture for computer graphics. This includes, but is not limited to: graphics pipeline, frame buffers, and graphic accelerators/co-processors.

Pre-requisites:

- Knowledge of Computer Programming, algorithms and mathematical method to implement graphics logic through the programming.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	Introduction: Computer Graphics, Elements of a Graphics, Application of Computer Graphics, I/O Devices, Display System, Color Monitors, Display Processors, Resolution	12
2	Scan Conversion Techniques : Image representation, Simple Line drawing Algorithm, DDA Line Drawing Algorithm, Bresenham's Line Drawing Algorithm, Simple Circle drawing Algorithm, Mid point Circle Drawing Algorithm, Bresenham's Circle Drawing Algorithm	10
3	2D & 3D Transformation : Translation, Rotation, Scaling, Reflection, Curves, Bezier curve, B-spline curve, viewing Transformation, Parallel and Perspective Projections	10



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4	Graphics Operations : Clipping, Window Port & Viewport Clipping, Line Clipping Algorithms, Sutherland Cohen Line Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.	08
5	Visibility: Character Generation, Generation of Bar Chart, Generation of Pie Chart, Stack Based Seed Fill Algorithm, Scan Line Seed Fill Algorithm, Z- buffer algorithms	08
Total hours		48

PRACTICAL LIST:

1	Implement all graphics function
2	Write a program to draw a flag
3	Draw a smiley using in built functions
4	Draw a rainbow using in built functions
5	Write a program to draw a clock
6	Write a program to draw a line using DDA Line Algorithm
7	Write a program to draw a line using Bresenham's Line Algorithm
8	Write a program to draw a lines of attributes using DDA Line Algorithm
9	Write a program to draw a Circle using Mid Point Circle Algorithm
10	Write a program to draw a Rubber Band Line using Mouse
11	Write a program to generate character using bitmap method
12	Write a program to draw polygon using graphics function
13	Write a program to fill polygon using flood fill algorithm
14	Write a graphics program to scale a polygon in which values of polygon edges and translation points will be given by user
15	Write a graphics program to rotate a polygon by using pivot-point in which values of polygon edges, pivot-point and rotation angle will be given by user
16	Write a graphics program for composite transformation which include translation, rotations and scaling
17	Write a program which reflects a polygon on different direction
18	Write a graphics program which translates a point from window-to-view port coordinate transformation
19	Write a graphics program for point clipping algorithm
20	Write a graphics program for Cohen-Sutherland Line clipping algorithm
Total hours	



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Learning Outcomes:

- Be able to design and implement models of surfaces, lights, sounds, and textures (with texture transformations) using a 2D graphics API.
- Be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.
- Be able to discuss future trends in computer graphics and quickly learn future computer graphics concepts and APIs.

Books Recommended:

- “Mathematical Elements for Computer Graphics”, **D.Rogers and J. Adams**, McGraw –Hill International Edition.
- “Procedural Elements for Computer Graphics”, **David F. Rogers**, McGraw Hill
- “Computer Graphics (Schaum Series)”, **Lipschutz**, McGraw Hill.
- “Computer Graphics”, **Dr. N. N. Jani**, Akshat Publication.