

COMPUTER GRAPHICS

Semester	Subject Code	Category	Lecture Hrs		Theory Hrs		Practical		Credits
			Per week	Per Sem	Per week	Per Sem	Per week	Per Sem	
V	21CCS5Ca	Elective - I	5	75	5	75	0	0	3

COURSE OBJECTIVE

- ☐ The course provides the overviews of learning about Computer Graphics, hardware, Transformation techniques and Animation

COURSE OUTCOME

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Learning the fundamental concepts of Computer graphics and Gain knowledge about graphics hardware devices and software used.	K1
CO2	To familiarize the student with the concept of two dimensional graphics and their transformations.	K2
CO3	Analyze the technique of three dimensional graphics and their transformations.	K3
CO4	Understanding the importance of illumination and color models.	K2
CO5	To learn about clipping techniques, morphing and fractals.	K4

Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze

MAPPING WITH PROGRAMME OUTCOME

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	M	S	S
CO2	L	S	M	M	S	M
CO3	S	M	S	M	S	S
CO4	S	S	M	S	M	M
CO5	M	S	S	M	M	M

S-Strong, M-Medium and L-Low

UNIT I: INTRODUCTION**14 Hours**

Survey of computer graphics - Overview of graphics systems – Video display devices - Raster scan systems - Random scan systems - Graphics monitors and Workstations - Input devices - Hard copy Devices - Graphics Software - Output primitives – Points and lines - Line drawing algorithms - Loading the frame buffer - Line function - Circle and Ellipse generating algorithms - Pixel addressing and object geometry - Filled area primitives.

UNIT II: TWO DIMENSIONAL GRAPHICS**16 Hours**

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates - Composite transformations - Two dimensional viewing – Viewing pipeline - Viewing coordinate reference frame - Window-to-viewport - Coordinate transformation - Two dimensional viewing functions - Clipping operations – Point - Line - Polygon clipping algorithms.

UNIT III: THREE DIMENSIONAL GRAPHICS**15 Hours**

Three dimensional concepts: Three dimensional object representations – Polygon surfaces- Polygon tables - Plane equations – Polygon meshes: Curved Lines and surfaces - Quadratic surfaces - Blobby objects - Spline representations – Bezier curves and surfaces - B-Spline curves and surfaces - Transformation And Viewing: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations: Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping: Visible surface detection methods.

UNIT IV: ILLUMINATION AND COLOUR MODELS**15 Hours**

Light sources – Basic illumination models – Halftone patterns and dithering techniques; Properties of light – Standard primaries and chromaticity diagram: Intuitive color concepts – RGB color model – YIQ color model – CMY color model – HSV color model – HLS color model: Color selection.

UNIT V ANIMATIONS & REALISM**15 Hours**

Animation Graphics: Design of Animation sequences – Animation function – Raster animation – Key frame systems – Motion specification – Morphing – Tweening - Computer Graphics Realism: Tiling the plane – Recursively defined curves – Koch curves – C curves Dragons – Space filling curves – Fractals – Grammar based models – Turtle graphics.

Distribution of Marks: Theory 75% and Applications 25%

TEXT BOOKS

S.No	Author	Title	Publisher	Year of Publication
1	John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley	Computer Graphics: Principles and Practice	3rd Edition, Addison-Wesley Professional,2013	2013

REFERENCES

S.No	Author	Title	Publisher	Year of Publication
1	Donald Hearn and M. Pauline Baker, Warren Carithers.	Computer Graphics With Open GL	4th Edition, Pearson Education	2010
2	Chopra Rajiv	Computer Graphics	S. Chand Publications	2017
3	Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, Kelvin Sung, and AK Peters	Fundamental of Computer Graphics,	CRC Press, 2010.	2010
4	William M. Newman and Robert F.Sproull,	Principles of Interactive Computer Graphics	Tata McGrawHill	2012
5.	James D. Foley, Andries Van Dam, Steven K. Feiner	Computer Graphics: Principles And Practice in C	Addison Wesley Publications	2014
6.	Sumanta Guha	Computer Graphics Through OpenGL	CRC Press	2015
7.	A.P.Godse	Computer Graphics	Technical Publications	2010
8.	Fabio Ganovelli, Massimiliano Corsini, Sumanta Pattanaik, Marco Di Benedetto	Introduction to Computer Graphics	CRC Press	2015

WEB RESOURCES

1. https://www.tutorialspoint.com/computer_graphics/index.htm
2. <https://www.javatpoint.com/computer-graphics-tutorial>

TEACHING METHODOLOGY

Class room teaching.
Group discussions
Seminars
Demo using systems
Chart/Assignment, Simulation Model
Smart Class room

SYLLABUS DESIGNER

- Mrs.G.SANGEETHA LAKSHMI, Assistant Professor & HOD, Dept of Computer Science & Applications
- Mrs.R BHUVANESHWARI, Assistant Prof, Dept of Computer Science & Applications