

3IT44: COMPUTER GRAPHICS
CREDITS – 4 (LTP: 3,0,2)

Course Objective:

To provide comprehensive knowledge about various algorithms to develop graphics and multimedia applications.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per Week)			Credits	Assessment Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE	CE	ESE	CE	150	
3	0	2	4	60	40	20		30

Course Contents:

Unit No.	Topics	Teaching Hours
1	Introduction to Computer Graphics: Fundamentals of computer graphics, Applications of computer graphics, Display devices, Random and raster scan systems, Graphics input devices, Graphics software and standards.	5
2	Graphics Primitives: Points, Lines, Circles and ellipses as primitives, Scan conversion algorithms, Fill area primitives including scan-line polygon filling, Inside outside test, Boundary and flood-fill, Character generation, Line attributes, Area-fill attributes, Character attributers.	8
3	2D transformation and viewing: Transformations(Translation, Rotation, Scaling), Matrix representation, Homogeneous coordinates, Composite transformations, Reflection and shearing.	8
4	2D viewing and clipping: Viewing pipeline and coordinates system, Window-to-viewport transformation, Clipping including point clipping, Line clipping (Cohen-sutherland, Liang- bersky, NLN), Polygon clipping.	8
5	3D transformation and viewing: 3D scaling, Rotation and translation, Composite transformation, Parallel and perspective transformation and projection.	8
6	Illumination and Color Models: Illumination, Light sources, Illumination methods (ambient, Diffuse reflection, Specular reflection), Color models: properties of light, XYZ, RGB, YIQ and CMY color models.	3
7	3D object representation: Polygon mesh representation, Spline representation, Bazier curve and B-spline curve.	3

Unit No.	Topics	Teaching Hours
8	Computer Animation: Design of animation sequences, Computer animation Techniques, Key frame animation, Morphing.	2
Total		45

List of References:

1. Donald Hearn and M.Pauline Baker, "*Computer Graphics C version*", Pearson Education.
2. Foley, VanDam, Feiner and Hughes, "*Computer Graphics Principles & practice*", Second edition in C, Pearson Education.
3. David F Rogers, "*Procedural elements for Computer Graphics*", Second edition, TataMcGraw hill.
4. David F Rogers, "*Mathematical elements for Computer Graphics*", Tata McGraw hill.

Course Outcomes (COs):

After successful completion of the course, students will be able to.....

1. Understand various aspects of computer graphics and visualization.
2. Illustrate the applicability of various graphics primitive algorithms.
3. Understand various concepts, theories and algorithms of 2D and 3D Graphics and develop graphics applications using the same.
4. Apply the concepts of various clipping algorithms to solve real world problems.
5. Understand various object representation and animation related concepts.
6. Apply various graphics algorithms to create real time graphics applications.