GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Integrated MSc, 6th Semester
Branch: Information Technology
Subject Name: Computer Graphics
Subject Code: 1360502

Teaching and Examination Scheme

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE(E)	PA (M)	PA (I)	ESE(V)	
3	0	2	4	70	30	20	30	150

Content:

Sr. No.	Content	Teaching Hours	Module Weightage (%)
1.	**Basic of Computer Graphics:** Basic of Computer Graphics, Applications of computer graphics, Display devices, Random and Raster scan systems, Graphics input devices, Graphics software and standards	4	15
2.	**Graphics Output Primitives:** Points, Lines, Circles and Ellipses as primitives, Scan conversion algorithms for primitives, Fill area primitives including Scan-line polygon filling, Inside Outside Test, Boundary and Flood-fill, Character Generation, Line attributes, Area fill attributes, Character attributers. Anti-aliasing	8	20
3.	**2D transformation and viewing:** Transformations (Translation, Rotation, Scaling), Matrix Representation, Homogeneous Coordinates, Composite Transformations, Reflection and Shearing, Viewing Pipeline and Coordinates System, Window-to-Viewport Transformation, Clipping including Point clipping, Line clipping (Cohen-Sutherland, Liang bersky, NLN), Polygon clipping, Text clipping	8	20
4.	**3D concepts and object representation:** 3D Display Methods, Polygon surfaces, Tables, Equations, Meshes, Curved lies and Surfaces, Quadric surfaces, Spline Representation, Cubic Spline Interpolation Methods, Bazier Curves and Surfaces, B-spline Curves and Surfaces	6	15
5.	**3D transformation and viewing:** 3D Translation, Rotation and scaling, Composite Transformation, Viewing Pipeline and Coordinates, Parallel and Perspective Transformation, View Volume and General (Parallel and Perspective) Projection Transformations	8	20
6.	**Advance topics:** Visible Surface Detection Concepts, Back-Face Detection, Depth Buffer Method, illumination, Light Sources, illumination methods (Ambient, Diffuse Reflection, Specular Reflection), Color models: Properties of light, XYZ, RGB, YIQ and CMY color models	6	10

Suggested Specification table with Marks (Theory):70

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15	20	15	10	5	5

R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Reference Books:

1. Computer Graphics,D.Hearn And P.Baker - Pearson Eduction - C Version, Latest edition
2. Computer Graphics, with OpenGLHearn and Baker, - Pearson
3. Computer Graphics, Sinha &Udai, - TMH
4. Computer Graphics, Foley and van Dam - Person Education

Course outcomes: Students will be able to

Sr. No	CO statement
1	To understand the basic computer graphics primitives as well as able to implement them
2	To learn, compare and apply various transformation techniques.
3	To design basic animations using latest graphics package software.
4	Students will be able to solve open design problems regarding surface and edge detection.
5	Students will be able to apply the knowledge, techniques, skills and modern tools to become successful professionals in graphics industries.