GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VI

Computer Engineering/Information Technology/Computer Science & Engineering

Subject Name: **Computer Graphics**
Subject Code: **160703**

Teaching Scheme				Evaluation Scheme		
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (Theory) (E)**	**Mid Sem Exam (Theory) (M)**	**Practical (I)**
4	0	2	6	70	30	50

Sr. No	Course Content	Total Hrs.
1.	Basic of Computer Graphics, Applications of computer graphics, Display devices, Random and Raster scan systems, Graphics input devices, Graphics software and standards	04
2.	**Graphics 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, antialiasing methods	14
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	12
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	14
5.	**3D transformation and viewing :** 3D scaling, rotation and translation, composite transformation, viewing pipeline and coordinates, parallel and perspective transformation, view volume and general (parallel and perspective) projection transformations	10

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	10

Text Book:

1. Computer Graphics C Version, D.Hearn And P.Baker, Pearson Eduction

Reference Books:

1. Procedural Methods for computer graphics, Rogers, TMH
2. Computer Graphics, Foley and van Dam, Person Education
3. Computer Graphics with virtual reality systems, R. K. Maurya, Wiley-India
4. Computer Graphics with OpenGL, Hearn and Baker, Pearson
5. Computer Graphics, Sinha & Udai, TMH
6. Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning