

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 attributes, 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 lines and surfaces, quadric surfaces, spline representation, cubic spline interpolation methods, B-spline 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
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Text Book:

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

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