

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VI

Computer Engineering

Subject Name: **Computer Graphics**

| 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 Education

References 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