GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 1

Computer Engineering

Subject Name Advanced Computer Graphics

Sr.No	Course content
1.	Review of two-dimensional graphics: Transformations, Windowing and Clipping
2.	Three Dimensions: 3D geometry, primitives and transformations. Rotation about an arbitraty axis. Parallel and perspective projcection. Viewing parameters. 3D clipping and viewing transformation
3.	Curves and Fractals: Polygon Meshes. Parametric Cubic curves: B- spline, Bezier, Hermite. Parametrice Bicubic Surfaces. Quadric surfaces. Fractals: fractal lines and surfaces. Applications.
4.	Solid Modelling: Representing solids. Regularized Boolean Set Opreations. Primitive Instancing. Sweep and Boundary Representations. Spatial-partitioning Representations. Constructive Solid Geometry. User Interface for Solid Modelling
5.	Achromatice and Coloured Light: Achromatice light, Gamma correction, Halftone approximation, Chromatice Colour. CIE chromaticity diagram, Colour models for Raster Graphices. Using Color in Computer Graphics
6.	Hidden Lines and Surfaces: Algorithms for Visible-Line and Surface determination: z-buffer, List priority, Scan line, Area Subdivsion, Ray Tracing
7.	Illumination and Shading: Surface detail, shadows and Transparency. Inter object Reflections. Illumination Models. Extended Light Sources. Recursive Ray Tracing
8.	Image based Rendering : Introduction, comparison with geometry based rendering, applications
9.	Animation : Introduction , morphing , character animation and facial animation
10.	Graphics Hardware: special-purpose computer graphics processors and accelerators.

Reference Books:

1. Computer Graphics: principles and practice Foley, vanDam, Feiner Hughes Addision Wesley
2. Mathematical Elements of Graphics Roges Tata McGrow Hill
3. Computer Graphics Donald Hearn and M.Pauline Baker Prentice Hall India
4. Procedural Elements-Computer Graphics, David Rogers, TMH
5. Principles of computer graphics, Shalini Govil-pal, springer