CS-5004 COMPUTER GRAPHICS & MULTIMEDIA

RATIONALE: The purpose of this subject is to introduce the concepts and techniques used in Computer Graphics ,Animations & Multimedia.
PREREQUISITE :- The students should have general idea about input/output devices and computing fundamentals. In addition, a familiarity with general mathematical transformations is required.

Unit-I
Introduction to Raster Scan displays, Pixels, Frame buffer, Vector & Character generation, Random Scan systems, Display devices, Scan Conversion techniques, Line Drawing: simple DDA, Bresenham's Algorithm, Circle Drawing Algorithms: Midpoint Circle drawing and Bresenham's Algorithm, Polygon fill algorithm: Boundary-fill and Flood-fill algorithms

Unit-II
2-D Transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation. Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping & Polygon Clipping Algorithms.

Unit-III
3-D Transformations: Translation, Rotation and Scaling. Parallel & Perspective Projection: Types of Parallel & Perspective Projection, Hidden Surface elimination: Depth comparison, Back face detection algorithm, Painter's Algorithm, Z-Buffer Algorithm. Curve generation, Bezier and B-spline methods. Basic Illumination Model: Diffuse reflection, Specular reflection, Phong Shading, Gouraud shading, Ray Tracing, Color models like RGB, YIQ, CMY, HSV.

Unit-IV
Multimedia : Characteristics of a multimedia presentation , Uses of Multimedia, Text -Types, Unicode Standard ,text Compression, Text file formats, Audio Components of an audio system, Digital Audio, Digital Audio processing, Sound cards, Audio file formats ,Audio Processing software ,Video-Video color spaces,Digital Video, Digital Video processing, Video file formats.

Unit -V
Animation: Uses of Animation, Principles of Animation, Computer based animation, 3D Animation, Animation file formats, Animation softwares. Compression: Lossless/Lossy Compression techniques, Image, Audio & Video Compressions, MPEG Standards ,Multimedia Architecture, Multimedia databases

Recommended Text:

1. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill
2. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.
3. Parekh "Principles of Multimedia" Tata McGraw Hill
4. Maurya, "Computer Graphics with Virtual Reality System " , Wiley India
5. Pakhira,"Computer Graphics ,Multimedia & Animation",PHI learning
6. Andleigh, Thakral , "Multimedia System Design " PHI Learning