PIT5J001 COMPUTER GRAPHICS

Module – I (12 hours)

Overview of Graphics System: Video Display Units, Raster-Scan and Random Scan Systems, Graphics Input and Output Devices.
Output Primitives: Line drawing Algorithms: DDA and Bresenham's Line Algorithm, Circle drawing Algorithms: Midpoint Circle Algorithm and Bresenham's Circle drawing Algorithm.
Two Dimensional Geometric Transformation: Basic Transformation (Translation, Rotation, Scaling) Matrix Representation, Composite Transformations, Reflection, Shear, Transformation between coordinate systems.

Module – II (12 hours)

Two Dimensional Viewing: Window-to- View Port Coordinate Transformation.
Line Clipping (Cohen-Sutherland Algorithm) and Polygon Clipping (Sutherland-Hodgeman Algorithm)
Aliasing and Antialiasing, Half Toning, Thresholding, Dithering.
Polygon Filling: Seed Fill Algorithm, Scan line Algorithm.
Two Dimensional Object Representations: Spline Representation, Bezier Curves, B-Spline Curves.
Fractal Geometry: Fractal Classification and Fractal Dimension.

Module – III (8 hours)

Three Dimensional Geometric and Modeling Transformations: Translation, Rotation, Scaling, Reflections, shear, Composite Transformation.
Projections: Parallel Projection, Perspective Projection.
Visible Surface Detection Methods: Back-Face Detection, Depth Buffer, A- Buffer, Scan- Line Algorithm, Painters Algorithm.

Module – IV (8 hours)

Illumination Models: Basic Models, Displaying Light Intensities.
Surface Rendering Methods: Polygon Rendering Methods: Gouraud Shading, Phong Shading.
Computer Animation: Types of Animation, Key frame Vs. Procedural Animation, Methods of Controlling Animation, Morphing.
Introduction to Virtual Reality and Augmented Reality.

Textbook:

1. Computer Graphics, D. Hearn and M.P. Baker (C Version), Pearson Education.

Reference Books:

1. Computer Graphics Principle and Practice, J.D. Foley, A. Dam, S.K. Feiner, Addison Wesley.
2. Procedural Elements of Computer Graphics, David Rogers, TMH.
3. Computer Graphics: Algorithms and Implementations, D.P Mukherjee, D. Jana, PHI.
4. Computer Graphics, Z. Xiang, R. A. Plastock, Schaum's Outlines, McGrow Hill.
5. Computer Graphics, S. Bhattacharya, Oxford University Press.