COMPUTER GRAPHICS
(Common to CSE & IT)

Course Code : 15CT1116

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Course Outcomes:

At the end of the Course, the Student will be able to:

CO 1 Discuss working principles of input/output devices.

CO 2 Apply 2D geometrical transforms.

CO 3 Apply 3D geometrical transforms.

CO 4 Explain visible surface detection methods.

CO 5 Discuss animation sequence.

UNIT-I (10 Lectures)

INTRODUCTION:

Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster - scan systems, random scan systems.

OUTPUT PRIMITIVES:

Points and lines, Line drawing Algorithms(DDA, Bresenham), mid-point circle drawing algorithm, Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II (10 Lectures)

2-D GEOMETRICAL TRANSFORMS:

Translation, scaling, rotation, reflection and shear transformations, matrix homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D VIEWING:

The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-

Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodge man polygon clipping algorithm.

UNIT-III (10 Lectures)

3-D GEOMETRIC TRANSFORMATIONS:

Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D VIEWING:

Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT-IV (10 Lectures)

VISIBLE SURFACE DETECTION METHODS:

Classification, back-face detection, depth-buffer, depth sorting, BSP-tree methods, area sub-division and octree methods.

WINDOWS PROGRAMMING:

Dos Programming Model, Windows Programming Model, Sample Window Program, Message Box, Creation and Display of Window, Interaction with Window, Reacting to Messages.

UNIT-V (10 Lectures)

COMPUTER ANIMATION:

Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C version", 2nd Edition, Pearson Education, 2011.
2. Foley, VanDam, Feiner and Hughes, "Computer Graphics Principles & Practice in C", 2nd Edition, Pearson Education,2002.

REFERENCES:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics",2nd Edition, PHI/Pearson Education, 2008.

2. Steven Harrington, “Computer Graphics - A Programming approach”, 1stEdition TMH, 2010.
3. YaswanthKanetkar, “Let Us C”, 9thEdition, Infinity Science Press, 2009.
4. David F.Rogers, “Procedural Elements for Computer Graphics”,2nd Edition, Tata McGrawHill,2014

WEB REFERENCE:

http://nptel.ac.in/courses/106106090/1