MANIPAL UNIVERSITY JAIPUR

School of Computing and Information Technology

Department of Computer Science and Engineering
Course Hand-out

Computer Graphics | CS 1503 | 4 Credits

Session: 2015-2016 | Faculty: Shikha Mundra

Course Outcomes: At the end of the course, students will be able to

[1503.1]. Describe graphical display systems, their working, and applications
[1503.2]. Analyse the underlying algorithms for the scan conversion of graphic primitives as per the needs of raster and random scan displays and enhance employability skills.
[1503.3]. Design and implement the model for spatial manipulation of graphic primitives using 2D and 3D transformations
[1503.4]. Comprehend the models for illumination and shading.
[1503.5]. Overview the core multimedia concepts and basics of animation.

SYLLABUS

Basics of Computer Graphics: Pixel, Frame buffer, Application of computer graphics, Raster Graphics fundamentals; Graphic Displays: Cathode Ray Tube, Random and Raster Scan displays; Scan Conversion: Line Generation- Digital Differential Analyzer (DDA), Bresenham's Algorithm, Algorithms for Circle Generation – Mid Point and Bresenham's Algorithm, Polygon generation and filling algorithms, Anti-aliasing; **Two Dimensional Transformations:** Introduction, Homogeneous representation of points, Basic transformation -Translation, Rotation, Scaling, Reflection, Shear; Clipping and Windowing: Point and Line Clipping, Cohen – Sutherland Algorithm, Sutherland - Hodgman Algorithm; **Three Dimensional transformation:** 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; Basic Illumination Model: Diffuse reflection, Specular reflection, Phong and Gouraud shading.

A. TEXT BOOKS

i. Computer Graphics C version/OpenGL version", Donald Hearn and M. Pauline Baker, 4th edition, Pearson Education.
ii. "Multimedia: Computing, Communications, and Applications", R. Steinmetz, Prentice Hall, 1995.

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