

MCPE2015 COMPUTER GRAPHICS AND MULTIMEDIA (3-0-0)

Course Objectives

- This course aims at teaching students about algorithms involved in 2D and 3D computer graphics and animation.
- It gives a clear foundation of the graphic operations performed on 2D objects.
- It enables the students to create 3D realistic objects and generate 2D, 3D animations.

Module 1

An Introduction Graphics System : Computer Graphics and Its Types, Application of computer graphics, Graphics Systems : Video Display Devices, Raster Scan Systems, Random Scan Systems, Graphics Monitors and Work Stations, Input Devices, Hard Copy Devices, Graphics Software.

Module 2

Output Primitives and Attributes of Output Primitives : Output Primitive Points and Lines, Line Drawing Algorithms, Circle Generating Algorithms, Scan-Line Polygon Fill Algorithm, Inside-Outside tests, Boundary-Fill Algorithm, Flood Fill Algorithm, Cell Array, Character Generation, Attributes of Output Primitives : Line Attributes, Color and Grayscale Levels, Area fill Attributes, Character Attributes, Bundled Attributes, Anti-aliasing.

Module 3

Two-dimensional Geometric Transformations : Basic Transformations, Matrix Representation and Homogeneous Coordinates, Composite Transformations, Reflection and Shearing. Two-Dimension Viewing : The viewing Pipeline, Window to view port coordinate transformation, Clipping Operations, Point Clipping, Line Clipping, Polygon Clipping, Text Clipping, Exterior Clipping. Three-Dimensional Concepts : Three Dimensional Display Methods, 3D Transformations, Parallel Projection and Perspective Projection.

Module 4

Multimedia : Introduction to Multimedia : Classification of Multimedia, Multimedia Software, Components of Multimedia – Audio : Analog to Digital conversion, sound card fundamentals, Audio play backing and recording Video, Text : Hypertext, Hyper media and Hyper Graphics, Graphics and Animation : Principle of animation, Types of Animation, deformation, character of animation, Key frame Vs. Procedural Animation, Methods of Controlling Animation, Morphing, Authoring Process and Tools.

Course Outcomes

CO1: Understand the basic shapes, 2D and 3D viewing in computer graphics.

CO2: Perform geometric transformations on objects.

CO3: Apply graphics algorithms for rendering objects and surfaces.

CO4: Create 3D objects in the graphics environment and render the scene using open-source tools.

Text Books:

1. Donald Hearn & M. Pauline Baker, "Computer Graphics with OpenGL", Third Edition, 2004, Pearson Education, Inc. New Delhi.
2. Ze-NianLi and Mark S. Drew, "Fundamentals of Multimedia", First Edition, 2004, PHI Learning Pvt. Ltd., New Delhi.