RAMAKRISHNA MISSION VIDYAMANDIRA

CBCS Syllabus B.Sc. Computer Science Honours

Semester-VI

Course Code: CMSA CC 14 Credit: 6
Course Type: Core Course

Course Outcome:

i) Introducing students to all aspects of computer graphics.
ii) To able to understand 2D transformation.
iii) Introducing students to 3D transformation.
iv) To be able to understand projection and clipping.
v) Understanding various practical applications of computer graphics.
vi) Implementing various transformation algorithms in C or other open source tools.

CMSA CC 14 T: Computer Graphics

Credit: 4   **Marks: 50**

Introduction: Basic concepts of Graphics Devices– CRT monitor, Monochrome and Color Monitor displaying technique only, Physical and logical units of graphics devices – Pixel and its different properties, Basic idea for image or picture formation using pixels – Raster Scan and Vector Scan. [7 L]

Basic geometrical shapes formation algorithms: Concepts Co-ordinate System, Line Segment, Digital Differential Analyzer, Circle and arc segment, Bresenham's and Midpoint scan conversion algorithms. [8 L]

Two Dimensional Transformations: Transformations operations - Translation, Rotation, Scaling. Reflection, Shearing and Inverse of these operations, Homogeneous coordinate system representation, matrix representation. Composite Transformations Operations – Basic ideas and matrix representations by matrix concatenation for a particular operation. Introduction to 3D transformation. [16 L]

Two Dimensional Clipping: View port, window port, display device, Point Clipping, Line Clipping, Cohen-Sutherland line clipping algorithm, Sutherland Hudgeman polygon clipping algorithm [10 L]

Projection: Basic Concept of Projection operation and its application, Classification – Perspective, Parallel and its subclasses, Principles of these projections (Geometric representation only, no Mathematical Foundation and algorithms) [8 L]

Applications: Basic Concepts Computer Art, Animation – Animating and modeling of real world, Morphing –Classification of morphing and Application to the Advertisements and publicities. [6 L]

Multimedia Data Formats: Image, Audio, Video; Multimedia Compression Techniques: JPEG, MPEG. [5 L]

CMSA CC 14 P: Computer Graphics Laboratory

Credit: 2   **Marks: 25**

Implementation using C and/or Octave. [20 L]

Introduction to Open GL. [20 L]

Recommended Books:

1. Computer Graphics C Version by Hearn, Baker; 2nd Edition; Pearson.
2. Computer Graphics, Multimedia and Animation by Pakhira, 2nd Edition; PHI.
3. Computer Graphics with Open GL by Hearn, Baker; 4th Edition; Pearson.