

COMPUTER GRAPHICS AND VISUALIZATION

Written by Administrator
Sunday, 08 November 2009 07:48 -

Subject Code

:

06CS65

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

COMPUTER GRAPHICS AND VISUALIZATION

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:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: Applications of computer graphics; A graphics system; Images: Physical and synthetic; Imaging systems; The synthetic camera model; The programmer's interface; Graphics architectures; Programmable pipelines; Performance characteristics. Graphics Programming: The Sierpinski gasket; Programming two-dimensional applications.

7 Hours

UNIT - 2

THE OPENGL: The OpenGL API; Primitives and attributes; Color; Viewing; Control functions; The Gasket program; Polygons and recursion; The three-dimensional gasket; Plotting implicit functions.

6 Hours

UNIT - 3

INPUT AND INTERACTION: Interaction; Input devices; Clients and servers; Display lists; Display lists and modeling; Programming event-driven input; Menus; Picking; A simple CAD program; Building interactive models; Animating interactive programs; Design of interactive programs; Logic operations.

7 Hours

UNIT - 4

GEOMETRIC OBJECTS AND TRANSFORMATIONS – 1: Scalars, points, and vectors; Three-dimensional primitives; Coordinate systems and frames; Modeling a colored cube; Affine transformations; Rotation, translation and scaling.

6 Hours

PART - B

UNIT - 5

GEOMETRIC OBJECTS AND TRANSFORMATIONS – 2: Transformations in homogeneous coordinates; Concatenation of transformations;

OpenGL transformation matrices; Interfaces to three-dimensional applications; Quaternions.

5 Hours

UNIT - 6

VIEWING: Classical and computer viewing; Viewing with a computer; Positioning of the camera; Simple projections; Projections in OpenGL; Hidden-surface removal; Interactive mesh displays; Parallel-projection matrices; Perspective-projection matrices; Projections and shadows.

7 Hours

UNIT - 7

LIGHTING AND SHADING: Light and matter; Light sources; The Phong lighting model; Computation of vectors; Polygonal shading; Approximation of a sphere by recursive subdivisions; Light sources in OpenGL; Specification of materials in OpenGL; Shading of the sphere model; Global illumination.

6 Hours

UNIT - 8

IMPLEMENTATION: Basic implementation strategies; The major tasks; Clipping; Line-segment clipping; Polygon clipping; Clipping of other primitives; Clipping in three dimensions; Rasterization; Bresenham's algorithm; Polygon rasterization; Hidden-surface removal; Antialiasing; Display considerations.

8 Hours

TEXT BOOK:

1. **Interactive Computer Graphics A Top-Down Approach with OpenGL** -Edward Angel, 5th Edition, Addison-Wesley, 2008.

REFERENCE BOOKS:

1. **Computer Graphics Using OpenGL** – F.S. Hill,Jr. 2nd Edition, Pearson Education, 2001.
2. **Computer Graphics** – James D Foley, Andries Van Dam, Steven K Feiner, John F Hughes, Addison-wesley 1997.

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3. **Computer Graphics - OpenGL Version** – Donald Hearn and Pauline Baker, 2nd Edition, Pearson Education, 2003.