

GUJARAT UNIVERSITY

K. S. SCHOOL OF BUSINESS MANAGEMENT
[Five Years' (Full-time) Integrated Degree Course]

Semester-5 [M.Sc. (CA & IT)]

Subject Code: - KS_C_CC-354

Subject Name: - Computer Graphics

Course Credit: - 3

Objective:

Understanding of 2D and 3D Graphics and graphics display devices, Understanding basic primitives their attributes and apply transformations on them, Knowledge of 2D and 3D geometry, matrices, basic trigonometry, basics of computer programming and data structures.

Unit No.	Course Content	Weight-age (%)
1	Point, Lines, Line segments, Vectors, Pixels and frame buffers Display devices:- Refresh CRT, Raster scan and random scan displays, color CRT monitors, Direct view storage tubes, Flat panel displays Line drawing algorithms:- DDA and BRESENHAM	(20%)
2	Introduction to random scan concepts: - Attributes of line color, width, style, caps and joins. Character generation Primitive operations, Display file interpreter, Normalized device coordinates, Display file structure, Display File algorithms, Display control, Text.	(20%)
3	Polygons: - Types of Polygons, Polygon representation, Inside-Outside tests, Polygon Interfacing Algorithms, Polygon filling algorithm, filling with a pattern 2-D Geometric Transformation: - Basic Transformations-translation, Rotation, Scaling, Homogeneous coordinate systems, Composite transformations, other transformations-Reflection, shear.	(20%)
4	Viewing and Clipping: - Viewing pipeline, viewing coordinate reference frame, window-to viewport coordinate transformation, Clipping- Point clipping, Line clipping algorithms-Cohen Sutherland, Liang Barsky. Polygon clipping algorithms-Sutherland Hodgeman, Weiler-Atherton, Curve clipping, text clipping, exterior clipping Segments: -Introduction, The segment table, Segment Creation, Closing a segment, deleting a segment, renaming a segment, Visibility Image transformation, saving and showing segments	(20%)

5	Introduction to 3-D geometry: -Depth cueing, visible line and surface identification, surface rendering, exploded cutaway views, stereoscopic views, Parallel Projection, Perspective projection, 3D transformations, Overview of 3D viewing and clipping	(20%)
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Recommended Lecture Scheme: Approximately 40 to 45 hours in a semester

Recommended Practical Scheme: Covered in KS_C_CC_356

Assignment: Minimum three assignments should be given.

Main Reference Books:

1. Computer Graphics 'C' Version
By Donald Hearn, M. Pauline Baker, Pearson Education, Second Edition
2. Computer Graphics: A programming approach
By Steven Harrington, McGraw -Hill,1987,Second Edition

Reference Books:

1. Computer Graphics: Principles and Practice
By J. Foley, A.van Dam, S. Feiner, and J. Hughes, Addison-Wesley, 1990.
2. Principles of Interactive Computer Graphics
By W. Newman and R. Sproull, McGraw-Hill Second Edition.
3. Theory and Problems of Computer Graphics
By R. Plastock and G. Kalley, McGraw-Hill International Edition, 1986.

Chapter wise coverage From Textbook:

- **Unit 1 :**
Chapter -2(Textbook1),
Chapter 1(Textbook2)
- **Unit 2 :**
Chapter -3(Textbook1),
Chapter 2(Textbook2)
- **Unit 3 :**
Chapter -5(Textbook1),
Chapter 3(Textbook2)
- **Unit 4 :**
Chapter -6(Textbook1),
Chapter 5(Textbook2)
- **Unit 5 :**
Chapter-9(Textbook1),
Chapter -11(Textbook1)
Chapter -12(Textbook1)