VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information Technology) Programme
5th Semester Syllabus

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Paper No. : 503
Paper Title : Interactive Computer Graphics [L:3, T:1]

1. Geometry & Line Generation
    - 1.1 Geometry
    - 1.2 Pixel & frame buffer
    - 1.3 Vector Generation : VECGEN & BRASENHAM Algorithm
    - 1.4 Character Generation
    - 1.5 Circle drawing

2. Graphics Primitives
    - 2.1 Display Devices
        - 2.1.1 Line & point plotting systems
        - 2.1.2 Raster, Pixel & Point plotters
        - 2.1.3 Continual refresh & storage displays
        - 2.1.4 Plasma Panel displays etc.
    - 2.2 Primitive operations
    - 2.3 Text

3. Polygons
    - 3.1 Polygon & its representation
    - 3.2 Inside Tests : Even Odd and Winding number method
    - 3.3 Filling polygons
        - 3.3.1 Flood & Scan line fill
        - 3.3.2 Filling with a pattern

4. Transformation
    - 4.1 Introduction to matrices
    - 4.2 Transformations
        - 4.2.1 Scaling transformation
        - 4.2.2 Rotation
        - 4.2.3 Translation
        - 4.2.4 Rotation about arbitrary Point
        - 4.2.5 Inverse and other transformations

5. Segments
    - 5.1 Introduction to segments
    - 5.2 Segment table
    - 5.3 Various operations on segments

6. Windowing & Clipping
    - 6.1 Windowing
    - 6.2 The viewing transformation
    - 6.3 Multiple windowing
    - 6.4 Clipping
        - 6.4.1 Cohen - Sutherland outcode Algorithm
        - 6.4.2 Sutherland - Hodgman Algorithm
    - 6.5 Generalized Clipping

7. Three Dimensions
    - 7.1 Geometry Of 3D
    - 7.2 3D primitives & Transformations
    - 7.3 Projection
    - 7.4 Windowing & Clipping

8. Light, Colour & Shading
    - 8.1 Diffuse Illumination
    - 8.2 Point-Source Illumination
    - 8.3 Reflection
    - 8.4 Shading
    - 8.5 Transparency
    - 8.6 Colours & Colour Tables

9. Approaches to infinity
    - 9.1 Tiling the plane
    - 9.2 Recursively defined curves
        - 9.2.1 Koch curve
        - 9.2.2 C-curve & Dragons
        - 9.2.3 Space filling curves
        - 9.2.4 Reptiles.
    - 9.3 Fractals
        - 9.3.1 Self similarity & curves
        - 9.3.2 Fractal trees

10. Introduction to Animation

Reference Books:

1. Giloi W.K. : Interactive Computer Graphics - PHI
2. Newman W. & Sproul P.F.: Principles Of Interactive Computer Graphics - McGraw-Hill
3. Rogers D.F. : Procedural Elements for Computer Graphics - McGrw-Hill
4. Harrington S. : Computer Graphics : Programming approach - Tata McGraw-Hill
5. Foley J.D., Vandam A. : Fundamentals Of Interactive Computer Graphics - Addison-Wesley
6. Hearn D., Baker P.M. : Computer Graphics - Prentice-Hall