Computer Graphics
Course Code: BEG372CO

Year: III   Semester: I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal		Final		Total
			Theory	Practical	Theory	Pratical	
3	2	3	20	50	80	-	150

Course Objective:

To be familiar with the basic techniques used in computer graphics system

1. Introduction   2 Hours

1.1. History of Computer graphics

1.2. Application of computer graphics

2. Graphics Hardware   8 Hours

2.1. Keyboard, Mouse (mechanical & optical), Light pen, Touch screen, Tablet input hardware, joystick

2.2. Raster and Vector display architecture

2.3. Architecture of simple non-graphical display terminals

2.4. Architecture of graphical display terminals including frame buffer and color manipulation techniques RGB, CMYK

2.5. Advanced raster graphic architecture

3. Two-dimensional Algorithms and Transformations   10 Hours

3.1. Direct and incremental line drawing algorithms

3.2. Bresenham algorithms line drawing for m>1 and m<1 (mid-point circle drawing and mid-point ellipse-drawing algorithms)

3.3. Two-dimensional translation, scaling (standard and directive), rotation, reflection, and shear

3.4. Recent transform concept and advantages

3.5. Windows-to-viewport transformation

4. Windows and Clipping   8 Hours

4.1. Introduction

4.2. The viewing transformation

4.3. Viewing transformation implementation

4.4. Clipping

4.5. The Cohen-Sutherland line-clipping algorithm

4.6. The Sutherland-Hodgman algorithm(Polygon Clipping)

5. Three-dimensional Graphics   **7 Hours**

5.1. Extension of two-dimensional transforms to three-dimensions

5.2. Three-dimensional object to screen viewing projection

5.3. Methods of generating non-planar surfaces (Bezier, Spline)

5.4. Hidden line and hidden surface removal techniques(Object and Image space method including A buffer)

5.5. Specialized and future three-dimensional display architectures

6. Light ,Color and shading   **5 Hours**

6.1. Introduction

6.2. Need for shading in engineering data visualization

6.3. Algorithms to simulate ambient, diffuse, and specular reflections

6.4. Constants, Gouraud, and Phong shading models

7. Graphical Languages   **4 Hours**

7.1. Need for machine independent graphical languages(PHIGS,GKS)

7.2. Discussion of available languages and file formats (Graphical file format)

8. Introduction to Animation   **1 Hour**

8.1. Open GL (Introduction only)

Lab:

1. Introductin to graphics primitives and graphics drivers
2. Implementation of line Drawing Algorithms.

   2.1 DDA

   2.2 Breselhem's Algorithm

   2.3 Breselhem's general Algorithm

3. Implementation of mid point circle Algorithm
4. Implementation of mid point ellipse Algorithm
5. Implemetation of basic 2D and 3D transformation
6. Implementation of windows to view port transformation

7. Implementation of line clipping process

References:
1. D. Harn and M. P. Baker, "Computer Graphics", PHI Edition
2. T. I. James, D. Foley, A. Van Dam, S. K. Feiner, and J. F. Hughes, "Computer Graphics, Principles,and Practice", PHI Edition

Marks Distribution

Chapter	Marks
1,2	18
3	18
4	15
5	14
6,7,8	15
Total	80