SYLLABUS

Maximum Marks: 100	**External:80**
Minimum Pass Marks: 35	**Internal: 20**
Time: 3 hours	

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type short-answer type questions covering the entire syllabus, in addition to that eight more questions will be set, two questions from each Unit. Students will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will I have to attempt four more questions selecting one question from each Unit All questions will carry equal marks.

UNIT-I

Introduction to Computer Graphics: Interactive and Passive Graphics, Applications of Computer Graphics: Display Devices: CRT, Random Scan, Rasher Scan, Refresh rate interlacing, Bit Plane, Color Depth, Color Palette, Color CRT Monitor, DVST, Flat-Panel Displays: Planes Displays: Plasma Panel, LED, LCD, Lookup Table, Interactive Input Devices, Display Processor, General Purpose Graphics Software, Coordinate Representations,

UNIT-II

Point-Plotting Techniques: Scan Conversion, Scan-Converting a Straight Line: The Symmetrical DDA, The Simple DDA, Bresenham's Line Algorithm, Scan-Converting Circle using Polar Coordinates, Bresenham's Circle Algorithm, Scan-Converting an Ellipse: Polynomial Method, Trigonometric Method; Polygon Area Filling: Scan-line Fill and Flood Fill Algorithms.

UNIT-III

Two-Dimensional Graphics Transformation, Basic Transformations: Translation, Rotation, Scaling Matrix Representations and Homogeneous Coordinates; Other Transformation Reflection, Shearing Coordinate Transformations; Composite Transformations, Inverse Transformation, Affine Transformations: Raster Transformation, Graphical Input: Pointing and Positioning Devices and Techniques

UNIT-IV

Two-Dimensional Viewing: Window and Viewport, 2-D Viewing Transformation Clipping: Point Clipping, Line Clipping Cohen Sutherland Line Clipping Algorithm, Mid-Point Subdivision Line Clipping Algorithm, Polygon Clipping Sutherland-Hodgman Polygon Clipping Algorithm; Three-Dimensional Graphics: Three-Dimensional Display Methods 3-D Transformations Translation, Rotation, Scaling, Composite Transformations.

TEXT BOOKS:
- Donald Hearn, M. Pauline Baker, "Computer Graphics", PHI
- Apurva A. Desai "Computer Graphics", PH1, 2010

REFERENCE BOOKS:
- Newmann & Sproull, "Principles of Interactive Computer Graphics", McGraw Hill
- Foley, "Computer Graphics Principles & Practice", Addison Wesley,
- Rogers, "Procedural Elements of Computer Graphics", McGraw Hill.
- Zhigang Xiang, Roy Plastock, "Computer Graphics, Tata McGraw Hill.
- D.P. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", PHI

COURSE OBJECTIVE:
The course objectives outlined are as follows:

- Understand and apply computer graphics principles including interactive and passive graphics, display devices, and input methods.

- Master point-plotting techniques and polygon filling algorithms for accurate graphical rendering.

- Gain proficiency in two-dimensional graphics transformations like translation, rotation, scaling, and reflection using matrix representations.

- Implement precise two-dimensional viewing transformations and clipping techniques for effective graphical output.

- Develop problem-solving skills through practical projects and critical analysis, while

- maintaining ethical standards in graphics system development and utilization.

COURSE OUTCOMES:
After the successful completion of the course, students will be able to:

- Understand the fundamental concepts of computer graphics, including interactive and passive graphics, display devices, and input methods.

- Apply various point-plotting techniques and polygon filling algorithms to render graphical objects accurately.
- Implement precise two-dimensional viewing transformations and clipping techniques to ensure effective graphical output.
- Develop problem-solving skills through practical projects and critical analysis of graphics algorithms.
- Gain familiarity with three-dimensional graphics concepts, including display methods and transformations, to manipulate three-dimensional objects effectively.

Lesson Plan

Week No	Scheduled Dates	Topics to be covered
1	1-6 January	Introduction to Computer Graphics; Interactive and Passive Graphics; Applications of Computer Graphics; Display Devices: CRT; Random Scan, Raster Scan, Refresh Rate and Interlacing,
2	8-13 January	Bit Planes, Color Depth, Color Palette, Color CRT Monitor, DVST, Flat-Panel Displays: Plasma Panel, LED, LCD; Lookup Table
3	15-20 January	Color Depth, Color Palette, Color CRT Monitor, DVST, Flat-Panel Displays: Plasma Panel, LED, LCD; Lookup Table,
4	22-27 January	Point-Plotting Techniques: Scan Conversion, Scan-Converting a Straight Line: The Symmetrical DDA
5	29-3 February	The Simple DDA, Bresenham's Line Algorithm; Scan Converting a Circle: Circle drawing using Polar Coordinates
6	5-10 February	Bresenham's Circle Algorithm, Scan-Converting an Ellipse: Polynomial Method, Trigonometric Method; Polygon Area Filling: Scan-line Fill and Flood Fill Algorithms.
7	12-17 February	Two-Dimensional Graphics Transformation: Basic

		Transformations: Translation, Rotation, Scaling
8	**19-24 February**	Matrix Representations and Homogeneous Coordinates; Other Transformations: Reflection, Shearing; Coordinate Transformations; Composite Transformations; Inverse Transformation
9	**26-2 March**	Composite Transformations; Inverse Transformation Affine Transformations; Raster Transformation; Graphical Input: Pointing and Positioning Devices and Technique
10	**4-9 March**	Two-Dimensional Viewing: Window and Viewport, 2-D Viewing transformation Clipping: Point Clipping;
11	**11-16 March**	Line Clipping: Cohen-Sutherland Line Clipping Algorithm, Mid-Point Subdivision Line Clipping Algorithm;
12	**18-23 March**	Polygon Clipping: Sutherland-Hodgman Polygon Clipping Algorithm;
13	**1-6 April**	Pointing and Positioning Devices and Technique .Three Dimensional Graphics: Three-Dimensional Display Methods
14	**8-13 April**	3-D Transformations: Translation, Rotation, Scaling; Composite Transformations.
15	**15-20 April**	Final Test, Assignments and REVISION of Contents
16	**22-27 April**	Previous Year Question Papers Discussion