

SANATAN DHARMA COLLEGE, AMBALA CANTT

College with Potential for Excellence, UGC, New Delhi
NAAC Accredited Grade "A+" with CGPA 3.51 in 3rd cycle
ISO 9001:2015 & ISO 14001:2015 Certified



Department of Computer Science Lesson Plan (Session 2022-2023)

Class: BCA

Sem: VI

Course Code: BCA-363

Nomenclature: Computer Graphics

Dates: 1 Feb, 2023- 17 May, 2023

SYLLABUS

BCA-245 Computer Graphics

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. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will 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, Raster Scan, Refresh Rate and Interlacing, Bit Planes, Color Depth, Color Palette, Color CRT Monitor, DVST, Flat-Panel 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 a Circle: Circle drawing 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 Transformations: 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", PHI, 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 Outcomes

After the completion of this course, prospective Computer professionals will have the ability to

CO-1	To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
CO-2	To learn the basic principles of 3- dimensional computer graphics.
CO-3	Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
CO-4	Provide an understanding of mapping from a world coordinate to device coordinates, clipping, and projections.
CO-5	To be able to discuss the application of computer graphics concepts in the development of computergames, information visualization, and business applications.
CO-6	To comprehend and analyze the fundamentals of animation, virtual reality, underlying technologies, principles

S.No	Instructional Technique	Assessment Methods (AM)
1	Chalk & Talk	Assignments
2	ICT tools	Quiz
3	Group discussions	Group Discussions
4	Industrial visit	Oral Tests
5	Case studies	Sessional
6	Small Projects	Presentations
7	Workshop	Seminar
8	Spoken Tutorials	University Exams
9	Flipped Class	
10.	E-Resources	

Detailed Lesson Plan

Date	Topics to be covered	Instructional Technique	Assessment Method
01.02.2023	Introduction to Computer Graphics; Interactive and Passive Graphics	2-(PPT/Projector)	1,2,3,4
05.02.2023	SUNDAY		
06.02.2023	Applications of Computer Graphics; Display Devices: CRT	2-(PPT/Projector)	1,2,3,4
07.02.2023	Random Scan, Raster Scan, Refresh Rate and Interlacing, Bit Planes,	2-(PPT/Projector)	1,2,3,4
08.02.2023	Color Depth, Color Palette	2-(PPT/Projector)	1,2,3,4
12.02.2023	SUNDAY		
13.02.2023	Color CRT Monitor, DVST, Flat-Panel Displays: Plasma Panel, LED, LCD	2-(PPT/Projector)	1,2,3,4
14.02.2023	Revision	2-(PPT/Projector)	1,2,3,4
15.02.2023	Lookup Table, Interactive Input Devices		4
19.02.2023	SUNDAY		
20.02.2023	Display Processor, General Purpose Graphics Software, Coordinate Representations	1	1,2,3,4
21.02.2023	Revision		4
22.02.2023	Point-Plotting Techniques: Scan Conversion,	2-(PPT/Projector)	1,2,3,4
26.02.2023	SUNDAY		
27.02.2023	Scan-Converting a Straight Line: The Symmetrical DDA, The Simple DDA	2-(PPT/Projector)	1,2,3,4
28.02.2023	Bresenham's Line Algorithm.	2-(PPT/Projector)	1,2,3,4
01.03.2023	Scan-Converting a Circle: Circle drawing using Polar Coordinates	2-(PPT/Projector)	1,2,3,4
05.03.2023	SUNDAY		
06.03.2023	HOLI VACATIONS		
07.03.2023			
08.03.2023			
09.03.2023			
10.03.2023			
11.03.2023			
12.03.2023	SUNDAY		

13.03.2023	Bresenham's Circle Algorithm	2-(PPT/Projector)	1,2,3,4
14.03.2023	Scan-Converting an Ellipse: Polynomial Method, Trigonometric Method	2-(PPT/Projector)	1,2,3,4
15.03.2023	Polygon Area Filling: Scan-line Fill and Flood Fill Algorithms	2-(PPT/Projector)	3,4
19.03.2023	SUNDAY		
20.03.2023	Revision		4
21.03.2023	Two-Dimensional Graphics Transformation: Basic Transformations: Translation, Rotation, Scaling	6	1,2,3,4
22.03.2023	Matrix Representations and Homogeneous Coordinates; Other Transformations: Reflection, Shearing	6	1,2,3,4
23.03.2023	HOLIDAY		
24.03.2023			
25.03.2023			
26.03.2023	SUNDAY		
27.03.2023	Coordinate Transformations; Composite Transformations	2-(PPT/Projector)	1,2,3,4
28.03.2023	Inverse Transformation; Affine Transformations; Raster Transformation.	2-(PPT/Projector)	1,2,3,4
29.03.2023	Graphical Input: Pointing and Positioning Devices and Techniques	2-(PPT/Projector)	1,2,3,4
02.04.2023	SUNDAY		
03.04.2023	Revision		
04.04.2023	HOLIDAY	2-(PPT/Projector)	1,2,3,4
05.04.2023	Two-Dimensional Viewing: Window and Viewport	2-(PPT/Projector)	1,2,3,4
09.04.2023	SUNDAY	2-(PPT/Projector)	1,2,3,4
10.04.2023	Assignment		
11.04.2023	2-D Viewing Transformation	2-(PPT/Projector)	1,2,3,4
12.04.2023	Clipping: Point Clipping; Line Clipping: Cohen-Sutherland Line Clipping Algorithm	2-(PPT/Projector)	1,2,3,4
16.04.2023	SUNDAY		
17.04.2023	Revision		4
18.04.2023	Subdivision Line Clipping Algorithm; Polygon Clipping	2-(PPT/Projector)	1,2,3,4
19.04.2023	Sessional		

23.04.2023	SUNDAY		
24.04.2023	Sutherland-Hodgman Polygon Clipping Algorithm	2-(PPT/Projector)	1,2,3,4
25.04.2023	Three-Dimensional Graphics: Three-Dimensional Display Methods	2-(PPT/Projector)	1,2,3,4
26.04.2023	Revision	2-(PPT/Projector)	1,2,3,4
30.04.2023	SUNDAY		
01.05.2023	Revision		4
02.05.2023	3-D Transformations: Translation, Rotation, Scaling; Composite Transformations		10
03.05.2023	Revision		
07.05.2023	SUNDAY		
08.05.2023	Revision		
09.05.2023	Revision		
10.05.2023	Revision		
14.05.2023	SUNDAY		
15.05.2023	Revision of Previous Years Question Papers		
16.05.2023	Revision of Previous Years Question Papers		
17.05.2023	Revision of Previous Years Question Papers		

	Teacher Incharge	Head of the Department
Name	Arti Sachdeva	Dr. Girdhar Gopal
Sign with Date		