



Lesson Plan

Program: BCA **Semester:** IV-A **Course Code:** BCA-401 **Course Name:** CGMA

Course Objectives

- CO1. To learn the principles of hardware and software behind the graphical environment and to learn about the design and implementation of graphical object by understanding basic algorithms for scan conversion of different graphical primitives.
- CO2. To learn display technologies like raster scan, random scan, video controller etc. and their comparison.
- CO3. To learn about transformation and modeling of original primitive and their clipped version into dimensional space by understanding the different algorithms, also their differences.
- CO4. To learn different curves and surfaces.
- CO5. To learn the creation of animated objects and their images by knowing various aspects of media and learn the concept of audio, images, videos and their differences.

Session Duration: 60 minutes

Participants: BCA Fourth Semester Students

Entry level knowledge and skills of students

- i. Computer Fundamentals
- ii.

Equipment required in Classroom/ Laboratory/ Workshop

- i. Projector
- ii. White Board & Marker

Assessment Schemes

S. No.	Criteria	Marks (100)
1	CCSU End Term Examination	75
2	Internal Evaluation Scheme	25
2(a)	Teacher Assessment (Continuous Evaluation) (Assignment & attendance)	25
2(a)(i)	Assignment -1	10
2(a)(ii)	Assignment -2	10
2(a)(iii)	Attendance (compulsory)	5

Course Outcomes

(CO1): Understand the basics of computer graphics, different graphics systems and applications of computer graphics and implement the various algorithms for scan conversion of different graphical primitives. *Understanding (K2), Applying (K3)*

(CO2): Understand the basics of display technologies and their comparison.



Understanding (K2), Applying (K3)

(CO3): Apply geometric transformations on original and clipped graphics objects and their application in composite form in 2D and 3D. *Applying (K3)*

(CO4): Understand the different curves and surfaces, also implement curves. *Applying (K3)*

(CO5): Understand the animation effects for transformation of different shapes and to differentiate between different multimedia systems. *Understanding (K2)*

L. No.	Topics	Sub Topics	Date of implementation	Pedagogy	CO-Covered	Faculty Sign	HoD's Remark with Date
Unit - I							
1.	Discussion about the Subject Syllabus and Learning outcomes	Course Objective & Course Outcome			CO-1 TO CO-6		
2.	Advantages of Interactive Graphics, Representative Uses of CG			<ul style="list-style-type: none"> Lecture 	CO-1		
3.	Classification of Application Development of H/W & S/W for computer Graphics, Conceptual Framework for Interactive Graphics			<ul style="list-style-type: none"> Lecture Brainstorming 	CO-1		
4.	Scan: Converting Lines	DDA Algo		<ul style="list-style-type: none"> Lecture Demonstration 	CO-1		
5.	Scan: Converting Lines	Bresenham Algo		<ul style="list-style-type: none"> Lecture Brainstorming 	CO-1		
6.	Scan: Converting Circle Algo	Mid-point, Bresenham Algo		<ul style="list-style-type: none"> Lecture Demonstration Brainstorming 	CO-1		
7.	Scan: Converting Ellipse Algo	Mid-point Algo		<ul style="list-style-type: none"> Lecture Brainstorming 	CO-1		
8.	Revision & doubt session of Unit-I	University question paper discussion		<ul style="list-style-type: none"> Discussion Brainstorming Buzz Grouping 	CO-1		
9.	Class Test of Unit-I				CO-1		



Unit - II							
10.	Hardcopy Technologies, Display Technologies, Raster-Scan Display System			•Lecture	CO-2		
11.	Video Controller, Random-Scan Display processor			•Lecture •Brainstorming	CO-2		
12.	Input Devices for Operator Interaction, Image Scanners			•Lecture	CO-2		
13.	Working exposure on graphics tools like Dream Weaver, 3D Effects etc.			•Lecture	CO-2		
14.	Southland-Cohen Algorithm			•Lecture • Demonstration	CO-2		
15.	Cyrus-Beck Algorithm, Midpoint Subdivision Algo			•Lecture •Demonstration	CO-2		
16.	Revision & doubt session of Unit-II	University question paper discussion		•Lecture •Buzz Grouping •Brainstorming	CO-2		
17.	Class Test of Unit-II			•Lecture	CO-2		
Unit - III							
18.	2D Transformation	Translation. Rotation, Scaling		•Lecture •Demonstration	CO-3		
19.	2D Transformation	Reflection, Shearing		•Lecture •Demonstration	CO-3		
20.	Homogenous coordinates & composition			•Lecture	CO-3		
21.	3D transformation	Translation. Rotation, Scaling		•Lecture •Brainstorming •Buzz Grouping	CO-3		



22.	3D transformation	Reflection, Shearing		<ul style="list-style-type: none"> •Lecture •Brainstorming •Buzz Grouping 	CO-3		
23.	Window-to-Viewport Transformations			<ul style="list-style-type: none"> •Lecture 			
24.	Revision & doubt session of Unit-III	University question paper discussion		<ul style="list-style-type: none"> •Lecture •Brainstorming 	CO-3		
25.	Class Test of Unit-III				CO-3		
Unit - IV							
26.	Polygon meshes parametric, Cubic Curves	Spline Curves		<ul style="list-style-type: none"> •Lecture 	CO-4		
27.	Cubic Curves	Hermite Curve		<ul style="list-style-type: none"> •Lecture •Demonstration 	CO-4		
28.	Cubic Curves	B-Spline Curve		<ul style="list-style-type: none"> •Lecture •Demonstration 	CO-4		
29.	Cubic Curves	Bezier curve		<ul style="list-style-type: none"> •Lecture •Demonstration 	CO-4		
30.	Quadratic surfaces, Solid modeling			<ul style="list-style-type: none"> •Lecture 	CO-4		
31.	Sweep, Boundary & Spatial Partitioning Representations, Constructive Solid Geometry			<ul style="list-style-type: none"> •Lecture •Brainstorming 	CO-4		
32.	Visible & hidden surfaces	Z-depth buffer, A-buffer Algo		<ul style="list-style-type: none"> •Lecture •Buzz Grouping 	CO-4		
33.	Polygon Clipping, Projection	Sutherland Hodgeman		<ul style="list-style-type: none"> •Lecture •Buzz Grouping 	CO-4		
34.	Revision & doubt session of Unit-IV	University question paper discussion		<ul style="list-style-type: none"> •Lecture •Brainstorming •Buzz Grouping 	CO-4		
35.	Class Test of Unit-IV				CO-4		
Unit - V							
36.	Multimedia Definition, CD-ROM and the multimedia highway	Types & Uses of multimedia		<ul style="list-style-type: none"> •Lecture 	CO-5		
37.	Animation (Design, types of animation, using different functions)			<ul style="list-style-type: none"> •Lecture •Buzz Grouping 	CO-5		



38.	The stage of Project, hardware & software requirements to make good multimedia skills			<ul style="list-style-type: none">•Lecture•Brainstorming	CO-5		
39.	Training opportunities in Multimedia Motivation for Multimedia usage			<ul style="list-style-type: none">•Lecture•Brainstorming	CO-5		
40.	Revision & doubt session of Unit-V	University question paper discussion		<ul style="list-style-type: none">•Lecture•Brainstorming•Buzz Grouping	CO-5		
41.	Class Test of Unit-V				CO-5		
42.	Revision of full syllabus			<ul style="list-style-type: none">•Lecture•Brainstorming•Buzz Grouping	CO-5		
43.	Doubt session of full syllabus			<ul style="list-style-type: none">•Brainstorming•Buzz Grouping	CO-5		

Text Books:

1. Computer graphics principles and practice 3e, person, 2014 : Hughes, van dam, et. al.
2. OpenGL Programming Guide, 2004 :Addison-Wesley
3. Multimedia Computing, Communications & Applications : Ralf Steinmetz, Klara Nahrstedt

Reference Books:

1. Computer Graphics : Udit Aggarwal
2. Fundamentals of computer Graphics, 2e, AK Peters, 2005 : P.Shirley
3. Computer Graphics & Multimedia, Galgotia Publications : R. K. Chauhan