SEMESTER 4

GRAPHICS AND MULTIMEDIA PRINCIPLES

Course Code	**PEAIT416**	**CIE Marks**	**40**
Teaching Hours/Week (L: T:P: R)	**3:0:0:0**	**ESE Marks**	**60**
Credits	**3**	**Exam Hours**	**2 Hrs 30 Min**
Prerequisites (if any)	**Mathematics and programming language**	**Course Type**	**Theory**

Course Objectives:

1. To make awareness about strong theoretical relationships between computer graphics and multimedia.
2. To understand three dimensional environment representation in a computer, transformation of 2D/3D objects, basic mathematical techniques and algorithms used to build useful applications.

SYLLABUS

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Module No.	Syllabus Description	Contact Hours
1	Basics of Computer graphics and Algorithms: Basics of Computer Graphics and its applications. Video Display devices- Refresh Cathode Ray Tubes, Random Scan Displays and systems, Raster scan displays and systems. Line drawing algorithms- DDA, Bresenham's algorithm. Circle drawing algorithms- Midpoint Circle generation algorithm, Bresenham's algorithm.	9
2	Filled Area Primitives and transformations: Filled Area Primitives- Scan line polygon filling, Boundary filling and flood filling. Two dimensional transformations-Translation, Rotation, Scaling, Reflection and Shearing, Composite transformations, Matrix representations and homogeneous coordinates. Basic 3D transformations.	9
3	Clipping and Projections : Window to viewport transformation. Cohen Sutherland Line clipping algorithm. Sutherland Hodgeman Polygon clipping algorithm. Three dimensional viewing pipeline. Projections- Parallel and Perspective projections. Visible surface detection algorithms- Depth buffer algorithm, Scan line algorithm.	9
4	Multimedia basics – Multimedia applications – Multimedia system architecture – Evolving technologies for multimedia –Defining objects for multimedia systems – Multimedia data interface standards – Multimedia databases. Compression and decompression – Data and file format standard.	9

Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	15	10	10	40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

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Course Outcomes (COs)

At the end of the course students should be able to:

	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Describe the working principles of graphics devices. (Cognitive Knowledge level: Understand)	K2
CO2	Illustrate line drawing, circle drawing and polygon filling algorithms. (Cognitive Knowledge level: Apply)	K2
CO3	Demonstrate geometric representations, transformations on 2D & 3D objects, clipping algorithms and projection algorithms. (Cognitive knowledge level : Apply)	K3
CO4	Summarize visible surface detection methods. (Cognitive Knowledge level: Understand)	K2

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2	3	2										
CO3	3	3	2							2		2
CO4	3											

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Computer Graphics	Donald Hearn and M. Pauline Baker	PHI, 2e	2e/1996
2	Computer Graphics and Multimedia	Atul P. Godse	Technical Publications	1e/2021

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Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Principles of Interactive Computer Graphics.	William M. Newman and Robert F. Sproull	McGraw Hill	1e/1973
2	Computer Graphics	Zhigang Xiang and Roy Plastock	McGraw Hill	3e/2019

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	**https://onlinecourses.nptel.ac.in/noc20_cs90/preview**