[Subject code-2611000906044003]

Course Code: 601-03
Course Title: Computer Graphics

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Course Title	**Computer Graphics (Minor-6-03)**
Credits	4
Course Category	Minor Course
Level of Course	200-299 (Intermediate Level)
Teaching Hours	60 Hours
Minimum Hours/ Semester	60 hours of Theory (Including class work, examination, preparation etc.)
Review / Revision	-
Implementation Year:	A.Y. 2025-2026
Purpose of Course	The purpose of the Computer Graphics course is to introduce students to the fundamentals of graphical systems, display technologies, and graphic standards. It enables students to apply algorithms and geometric transformations to create and manipulate basic graphical objects.
Course Objective	1) Define the key concepts, application areas, and file formats used in computer graphics. 2) Explain the working principles of various video display devices and scanning techniques. 3) Apply line drawing algorithms to generate basic graphic primitives like lines and circles. 4) Analyze the effects of geometric transformations such as scaling, rotation, translation, reflection, and shearing. 5) Create simple graphic designs by integrating graphical objects and transformation techniques.
Pre-requisite	The prerequisite for the Computer Graphics course is a basic understanding of programming concepts and mathematical foundations such as coordinate geometry and matrix operations.
Course Outcomes	**CO-1:**Remembering**:** Recall the application areas, file formats, and graphic standards used in computer graphics systems. **CO-2:**Understanding**:** Describe the architecture and functioning of various display devices, scan methods, and graphic object types. **CO-3:Applying:** Implement standard line drawing algorithms such as DDA and Bresenham for rendering basic graphic primitives. **CO-4:Analyzing:** Analyze the behavior and effects of geometric transformations like scaling, rotation, translation, reflection, and shearing on 2D objects. **CO-5:Creating:**Construct and manipulate graphical objects by integrating transformations and rendering techniques for simple graphic applications.
Mapping between Course Outcomes(CO) with Program Specific Outcomes(PSO)	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	■		■	■		■		
CO2	■	■			■			
CO3	■			■			■	
CO4			■			■		■
CO5	■			■		■	■	■

Course Content	**Unit 1. Introduction** 1.1 Application areas of Graphics Systems 1.1.1. Presentation Graphics 1.1.2. Entertainment 1.1.3. Education and Training 1.1.4. Image Processing 1.2 Computer Graphics Files 1.3 Introduction to graphic standards **Unit 2. Graphics Systems** 2.1. Video Display Devices

	2.1.1. Refresh CRT 2.1.2. Color CRT 2.1.3. LCD 2.1.4. Direct View Storage Tube 2.2. Raster scan and Random Scan Display 2.3. Raster Graphics and Vector Graphics 2.4. Concepts of various objects: Point, Line, Circle, Ellipse and Polygons **Unit 3. Line generation** 3.1. Geometry of line 3.2. Frame Buffer 3.3. Line Drawing Algorithms 3.3.1. DDA Algorithm 3.3.2. VECGEN 3.3.3. Bresnahan 3.4. Line Styles 3.4.1. Thick line 3.4.2. Line caps and joint **Unit 4. Geometric Transformations** 4.1 Basic Transformations 4.1.1 Scaling 4.1.2 Translation 4.1.3 Rotation 4.1.3.1 Rotation about origin 4.1.3.2 Rotation about Homogeneous Coordinates 4.2 Other transformations 4.2.1 Reflection 4.2.2 Shearing [All Units carry Equal Weightage]
Reference Books	1. Computer Graphics - second edition, Donald Hearn & M. Pauline Baker – Tata McGraw Hill Pub. 2. Computer Graphics, Harrington S. -Tata McGraw Hill. 3. Computer Graphics, Desai A. A. –PHI. 4. Computer Graphics: Algorithms & Implementations, Mukherjee & Jana – PHI. 5. Interactive Computer Graphics, Giloi W. K. –Prentice Hall India. 6. Principles of Interactive Computer Graphics, New Man W. & Sproul P. F. –McGraw Hill 7. Procedural Elements for Computer Graphics, Rogers D. F. – McGraw Hill.
Teaching Methodology	Class Work, Discussion, Presentation, Self-Study, Seminars and/or Assignments
Evaluation Method	50% Internal assessment. - Attendance, Class and home Assignment - Unit Tests 50% External assessment. - Written Theory exam