



GUJARAT UNIVERSITY

BCA V SYLLABUS

COURSE TITLE		FC301 Computer Graphics
COURSE CODE	FC-301	
COURSE CREDIT	3	
Session Per Week	3	
Total Teaching Hours	40 HOURS	
AIM		
This course aims to familiarize students with the concepts in computer graphics. This course also aims to introduce the students to apply presentation graphics, image processing, graphics system, output primitives, two-dimensional viewing and other graphics system.		
LEARNING OUTCOME		
The student would be able		
1. To familiarize with the concepts, tools and practices of graphics system.		
2. To understand what is need of output devices and input devices, with references to graphics system.		
3. To familiar with two-dimensional geometric transformation and viewing.		
DETAIL SYLLABUS		
UNIT	TOPIC / SUB TOPIC	EACHING HOURS
1	Survey of Computer Graphics and Overview of Graphics System	10
	❖ Survey of Computer Graphics ➤ Computer-Aided Design ➤ Presentation Graphics ➤ Computer Art ➤ Entertainment ➤ Education and Training ➤ Visualization ➤ Image Processing ➤ Graphical User Interfaces ❖ Overview of Graphics Systems ➤ Video Display Devices ➤ Refresh Cathode Ray Tubes ➤ Raster-Scan Displays ➤ Color CRT Monitors ➤ Direct-View Storage Tubes	❖

	➤ Flat-Panel Displays ➤ Three Dimensional Viewing Devices. ➤ Stereoscopic and Virtual-Reality Systems ➤ Raster-Scan Display Processor ➤ Random-Scan Systems ❖ Input Devices ➤ Keyboards ➤ Mouse ➤ Trackball and Spaceball ➤ Joysticks ➤ Data Glove ➤ Digitizers ➤ Image Scanners ➤ Touch Panels ➤ Light Pens ➤ Voice Systems ❖ Coordinate Representations ❖ Graphics Functions ❖ Software Standards ❖ PHIGS Workstations ➤	
	❖ Output Primitives	10
2	➤ Points and Lines ➤ Line-Drawing Algorithms, DDA Algorithm, Bresenham's Line Algorithm ➤ Loading the Frame Buffer ➤ Circle-Generating Algorithm, Properties of Circles, Midpoint Circle Algorithm ➤ Filled-Area Primitives, Scan-Line Polygon Fill Algorithm, Inside-Outside Tests, Scan-Line Fill of Curved Boundary Areas, Boundary-Fill Algorithm, Flood-fill Algorithm	
	❖ Attributes of Output Primitives and Two-Dimensional Geometric Transformation	10
3	❖ Attributes of Output Primitives ➤ Line Attributes, Line Type, Line Width, Pen and Brush Options, Line Color ➤ Color and Grayscale Levels ➤ Antialiasing ❖ Two-Dimensional Geometric Transformation ➤ Basic Transformation ➤ Matrix Representations and Homogeneous Coordinates ➤ Composite Transformations ➤ Other Transformations	
4	Two-Dimensional Viewing	10

	➤ The Viewing Pipeline ➤ Viewing Coordinate Reference Frame ➤ Window-to-Viewport Coordinate Transformation ➤ Clipping Operations ➤ Point Clipping ➤ Line Clipping, Cohen-Sutherland Line Clipping, Liang-Barsky Line Clipping, Nicholl-Lee-Nicholl Line Clipping, Line Clipping Using Nonrectangular Clip Windows, Splitting Concave Polygons ➤ Polygon Clipping, Sutherland-Hodgeman Polygon Clipping, Weiler-Atherton Polygon Clipping, Other Polygon-Clipping Algorithm	
Textbook		
Computer Graphics C Version, Second Edition Donald Hearn, M. Pauline Baker		