

The Maharaja Sayajirao University of Baroda Polytechnic Higher Payment Program Diploma in Computer Engineering			ACADEMIC YEAR 2021-2022		
Year	III	COMPUTER GRAPHICS (CSE3520)	Lecture Hrs per week	4	
Semester	I		Max marks	100	
Pre-requisite: Basics of 2D and 3D , Basics of Multimedia and Animation					
CO1	Explain the fundamental concepts of computer graphics, including characteristics, components, display devices and input/output devices.				
CO2	Apply various output primitives and drawing algorithms such as DDA, Bresenham’s algorithms, circle/ellipse algorithms, and area-filling techniques.				
CO3	Apply 2-D geometric transformations and viewing operations, including translation, rotation, scaling, clipping and viewing pipeline.				
CO4	Implement 3-D geometric transformations, projection techniques, and viewing pipeline to visualize three-dimensional objects and visible surface detection methods.				
CO5	Describe illumination models, multimedia concepts, compression techniques, and animation principles for creating effective graphical applications.				
BT	1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation				
COURSE CONTENT/SYLLABUS					
Unit	Unit Name		Hrs	Weightage	CO
1	Overview of Computer Graphics Characteristics Of Computer Graphics, Components of Computer Graphics, Classification of Computer Graphics, Application of Computer Graphics, Advantages of Computer Graphics, Display Devices, Raster Scan Systems, Random Scan System, Graphics Input Devices, Graphics Output Devices, Graphics Software and Standards.		6	10	CO1
2	Output Primitives Points and Lines, Line Drawing Algorithms: DDA Algorithm, Bresenham's Line Algorithm, Parallel Algorithm; Properties of Circle, Circle Generating Algorithms: DDA Circle,Algorithm, Bresenham's Circle Algorithm, Midpoint Circle Drawing Algorithm; Ellipse Generating Algorithm: Properties of Ellipse, Midpoint Ellipse Algorithm, Fill Area Primitives: Inside-Outside Test, Solid Area Filling algorithms: Boundary Fill Algorithm, Flood Fill Algorithm, Scan Line Feed Algorithm, Scan Line Seed Fill Algorithm; Character Generation, Character Attributes, Antialiasing		12	18	CO2, CO4
3	2-D Geometric Transformation and Viewing 2D Basic Transformations: Translation, Rotation, Scaling, Homogeneous Coordinates, Composite Transformations, Reflection and Shear Transformation, Transformation between Coordinate Systems, Inverse Transformation, Windows and Viewport, Viewing Pipeline, Point Clipping, Line clipping: Cohen-Sutherland Line Clipping Algorithm, Midpoint Subdivision Method, Liang-Barsky Line Clipping Algorithm, Cyrus-Beck Line Clipping Algorithm, Nicholl-Lee-Nicholl Line Clipping Algorithm		12	22	CO2, CO3
4	3-D Geometric Transformations and Viewing 3D Basic Transformations: Translation, Rotation, Scaling, Reflections, Shearing, Composite Transformations, Viewing Pipeline, Projections		10	16	CO2, CO4
5	Visible Surface Detection Methods and Illumination Models Classification of Visible Surface Detection Algorithm, Back Face Detection, Depth Buffer method, A-buffer method, Scan Line method, Depth sorting method, BSP-Tree Method, Area-subdivision method, Light sources, Basic Illumination Models		10	16	CO4, CO5
6	Multimedia and Animation Concepts of Multimedia: Elements of Multimedia system, Types of Multimedia, Hardware and Software Requirements, Applications of Multimedia, Multimedia Authoring; Digital Audio, MIDI, Image Compression Standards, Video Compression and Encoding, Hypertext and Hypermedia, Categories of Animation, Principle		8	18	CO5

	of Animation systems, Design of Animation Sequences, Problems in Computer Animation, Animation Functions, Animation Techniques, Uses of Animation, Animation Software, Animation File Formats.			
		58	100	

REFERENCE BOOKS:

1.	Computer Graphics, D.Hearn And P.Baker - Pearson Education - C Version
2.	Computer Graphics, Udit Agrawal
3.	Computer Graphics, Multimedia and Animation By Pakhira Malay K
4.	Computer Graphics, A Practical Approach, Concepts, Principles, Case Studies, Experiments, Er. Raiiv Chopra, S. Chand and Company Ltd.
5.	Computer Graphics, Foley and van Dam - Person Education.
6.	Computer Graphics, Sinha & Udai, - TMH