SCHEME OF COURSE WORK

Course Details:

Course Title	**: Computer Graphics**		
Course Code	**:15CT1116**	**L T P C**	**: 3 0 0 3**
Program:	**: B.Tech**		
Specialization:	**: Computer Science & Engineering** **Information Technology**		
Semester	**: v**		
Prerequisites	**: Mathematics, Computer Programming through C**		
Courses to which it is a prerequisite	**: Image Processing**		

Course Outcomes (COs):

At the end of the course the student will be able to

1	Acquire the knowledge about working principles of different Output devices.
2	Different types of 2D and 3D graphics along with transformation techniques.
3	Get the idea about projections of different views of objects along with elimination of invisible components (points, lines and surfaces).
4	Motion oriented graphics will give the idea about implementing different animation sequences.
5	Get knowledge on visible surface detection methods.

Course Outcome versus **Program Outcomes:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3	2							2		
CO2	2	3											2		
CO3	3	3	2	3	3								2		
CO4	3	3	3	2	2								2		
CO5	3	3	3		3								2		

3 - Strongly correlated, *2* - *Moderately* correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	Topic / Contents	Course Outcomes	Sample Questions	Teaching-Learning Strategy	Assessment Method & Schedule
1	**UNIT-I:** Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices	CO1	1) What is pixel? Explain Rasterization and Scan Conversion 2) What are the various output display devices?	=Lecture	Quiz-1 Mid-1
2	Raster - scan systems, random scan systems, graphics monitors and work stations and input devices	CO1	1) What are the differences between Vector scan and Raster scan displays? 2) What are General purpose and special purpose input devices?	=Lecture	Quiz-1 Mid-1
3	**OUTPUT PRIMITIVES :** Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.	CO1	1) Explain and Compare DDA Line Drawing Algorithm with Bresenham's Line Drawing Algorithm. 2) Explain Mid-point Circle Drawing Algorithm.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1 Assignement-1
4	Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood-fill algorithms.	CO1	1) Explain Seed Filling Algorithms. 2) Explain Scan Line Algorithm.	=Lecture =Program Writing	Quiz-1 Mid-1 Assignement-1
5	**UNIT-II: 2-D GEOMETRICAL TRANSFORMS:** Translation, scaling, rotation, reflection and shear transformations, matrix homogeneous coordinates, Composite transforms. transformations between Coordinate systems.	CO2	1) Explain the transformation that is rotation about an arbitrary point. 2) Explain Homogeneous coordinating system	=Lecture =Working Examples	Quiz-1 Mid-1
6	**2-D VIEWING:** The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions,	CO2	1) Explain Window-View port transformation with an example. 2) Explain various viewing functions.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1 Assignement-1
7	Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon Clipping algorithm.	CO2	1) Explain Cyrus-Beck Line clipping algorithm 2) Explain Sutherland-Hodgeman polygon clipping algorithm.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1
8	**UNIT-III: 3-D GEOMETRIC TRANSFORMATIONS:** Translation, rotation, scaling, reflection and shear transformations, composite transformations.	CO2	1) Explain Reflection and Shear transformations in 3D. 2) Explain Basic Transformation techniques in 3D.	=Lecture =Working Examples	Quiz-1 Mid-1
9	**MID TEST-1**				
10	**3-D VIEWING:** Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.	CO2, CO3	1) What is view volume? Explain 3D clipping. 2) What are the various techniques in Parallel Projections?	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2 Assignment-2
11	Introduction to curves: spline and Bezier curve.	CO2	1) What is the difference between curves and splines	=Lecture	Quiz-2 Mid-2
12	**UNIT-IV: VISIBLE SURFACE DETECTION METHODS:** Classification, back-face detection, depth-buffer, scan-line.	CO5	1) What is back-face detection? Explain the process for eliminating invisible surface. 2) Explain Depth-Buffer Algorithm.	=Lecture =Program Writing	Quiz-2 Mid-2
13	Depth sorting, BSP-tree methods, area sub-division and Octree methods.	CO5	1) Explain Waarnock's area sub division algorithm. 2) Explain Octree Method for visible surface detection.	=Lecture =Program Writing	Quiz-2 Mid-2 Assignment-2
14	**WINDOWS PROGRAMMING:** Dos Programming Model, Windows Programming Model, Sample Window Program.	CO4	1) What is DOS-programming model? 2) Explain how to write sample window program.	=Lecture =Program Writing	Quiz-2 Mid-2
15	Message Box, Creation and Display of Window, Interaction with Window, Reacting to Messages.	CO4	1) Write a programming segment for creation and display of window. 2) What are the various methods for Reacting to messages?	=Lecture =Program Writing	Quiz-2 Mid-2 Assignment-2
16	**UNIT-V : COMPUTER ANIMATION:** Design of animation sequence, general computer animation functions, raster animation.	CO4	1) Explain Design of animation sequence. 2) Explain Raster Animation.	=Lecture	Quiz-2 Mid-2
17	Computer animation languages, key frame systems, motion specifications	CO4	1) Explain different animation languages. 2) Explain Key-fram specifications	=Lecture =Working Examples	Quiz-2 Mid-2 Assignment-2
18	**MID TEST-2**				
19/20	**END EXAM**				