

Course code	Course Name	L-T-P-Credits	Year of Introduction
IT367	Computer Graphics & Multimedia	3-0-0-3	2016
<b>Prerequisite : Nil</b>			
<b>Course Objectives</b>			
<ul style="list-style-type: none"> <li>To build an understanding of the fundamental concepts of Computer Graphics &amp; Multimedia</li> <li>To familiarize with the working principles of various display technologies.</li> <li>To prepare for understanding advanced courses in Computer Graphics.</li> </ul>			
<b>Syllabus</b>			
Graphics Systems, Line & Circle generation Algorithms, Compression techniques in Multimedia, Display Technologies, Transformations in 2D and 3D, Matrix representation of transformations, Clipping Algorithms, Hidden surface removal techniques, Digital Image processing.			
<b>Expected Outcome</b>			
The students will be able to			
<ol style="list-style-type: none"> <li>Explain the techniques used for display in CRT, LCD, LED displays.</li> <li>Identify the intermediate points needed to plot a line, given only its end points.</li> <li>Write the matrix corresponding to various 2D &amp; 3D transformations.</li> <li>Find the vertices of the clipped polygon against a rectangular window by applying the learned polygon clipping algorithm.</li> <li>Write an algorithm for finding &amp; labeling different regions in a digital image.</li> </ol>			
<b>References</b>			
<ol style="list-style-type: none"> <li>Donald Hearn, Pauline Baker, “ <i>Computer Graphics – C Version</i>”, Pearson Education.</li> <li>Steinmetz R. &amp; Nahrstedt K., “<i>Multimedia: Computing, Communications and Applications</i>”, Pearson Education.</li> <li>David F. Rogers, “<i>Procedural Elements for Computer Graphics</i>”, Tata McGraw-Hill</li> <li>Foley, van Dam, Feiner &amp; Hughes, “<i>Computer Graphics Principles &amp; Practice</i>”, Pearson Education.</li> <li>William M. Newman, Robert F. Sproull, “<i>Principles of Interactive Computer Graphics</i>”, Tata McGraw-Hill.</li> <li>David F. Rogers, J. Alan Adams, “<i>Mathematical Elements for Computer Graphics</i>”, Tata McGraw-Hill.</li> <li>Tay Vaughan, “<i>Multimedia: Making it Work</i>”, Tata McGraw-Hill.</li> </ol>			
Module	Course Plan	Hours	Sem. Exam Marks
I	Graphics Systems – Raster Scan & Random Scan systems. Output Primitives – Line Drawing Algorithms (DDA, Bresenham), Circle generation algorithm. Filled Area Primitives – Scan Fill, Flood Fill, Boundary Fill. Inside outside tests.	7	15%
II	Multimedia: Data Compression- Source, Entropy & Hybrid Coding, Basic compression techniques, JPEG, H.261, MPEG, DVI.	7	15%
<b>FIRST INTERNAL EXAM</b>			
III	Display Technologies: Working principle behind CRT, LCD, Plasma, LED, OLED, AMOLED, E-Paper displays.	6	15%

<b>IV</b>	2-Dimensional Geometric Transformations ( Basic Transforamtions, Reflection & Shear), Homogenous Matrix representation of transformations. Composite Transformations.	<b>7</b>	<b>15%</b>
<b>SECOND INTERNAL EXAM</b>			
<b>V</b>	2-D Clipping- Point Clipping, Cohen-Sutherland Line Clipping Algorithm, Sutherland-Hodgeman Polygon Clipping Algorithm. 3-Dimensional Geometric Transformations -Basic Transforamtions, Composite 3 D transformations.	<b>8</b>	<b>20%</b>
<b>VI</b>	Visible Surface Detection Methods: Back Face Detection, Depth Buffer, A-Buffer, Scan line, Depth sorting methods. Digital Image Processing: Histogram, Equalisation, Image Segmentation, Region Labeling.	<b>7</b>	<b>20%</b>
<b>END SEMESTER EXAM</b>			

### QUESTION PAPER PATTERN

Maximum Marks: 100

Exam Duration: 3 hours

The question paper shall consist of Part A, Part B and Part C.

**Part A** shall consist of three questions of 15 marks each uniformly covering Modules I and II. The student has to answer any two questions (15×2=30 marks).

**Part B** shall consist of three questions of 15 marks each uniformly covering Modules III and IV. The student has to answer any two questions (15×2=30 marks).

**Part C** shall consist of three questions of 20 marks each uniformly covering Modules V and VI. The student has to answer any two questions (20×2=40 marks).

**Note :** Each question can have a maximum of 4 subparts, if needed