INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

COMPUTER GRAPHICS AND MULTI MEDIA SYSTEMS								
VI Semester: IT								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
AITD18	**Elective**	3	0	0	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: There is no prerequisite to take this course								

I. COURSE OVERVIEW:

The Objective of this course is to provide students with the knowledge and understanding of media representation, storage, communication, and processing by digital means, with an emphasis on audio, still images, and video media. It includes an introduction to sampling theory and various representation techniques. This is used to describe and explain a variety of real devices, formats, and standards.

II. COURSE OBJECTIVES:

The students will try to learn

I. How to describe a firm grounding in the fundamentals of the underpinning technologies in graphics, distributed systems and Multimedia?
II. The principled design of effective media for entertainment, communication, training and education
III. The experience in the generation of animations, virtual environments and multimedia applications, allowing the expression of creativity.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to

CO1 Demonstrate Knowledge and Understanding of the concepts Illumination, Colour Models
CO2 Describe 2D geometric transformations, Matrix representations, Viewing pipeline, and frame elements into clipping operations polygon algorithms.
CO3 Analyze the ability to extend their basic in 3D Graphics, Projections
CO4 Evaluate Multimedia System Design and File Handling
CO5 Evaluate Digital Audio − Video
CO6 Use immersive effects of Hypermedia Case Study experiences and evaluate implementation methods.

IV. COURSE CONTENT:

MODULE-I ILLUMINATION AND COLOR MODELS (09)
Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection. Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives

MODULE-II: TWO-DIMENSIONAL GRAPHICS (09)
Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two-dimensional viewing – viewing pipeline, viewing coordinate reference frame; window-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

MODULE-III: THREE-DIMENSIONAL GRAPHICS (09)
Three dimensional concepts; Three-dimensional object representations – Polygon surfaces Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces - BSpline curves and surfaces.

TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three-dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

MODULE-IV: MULTIMEDIA SYSTEM DESIGN & MULTIMEDIA FILE HANDLING (09)
Multimedia basics − Multimedia applications − Multimedia system architecture – Evolving technologies for multimedia Defining objects for multimedia systems − Multimedia data interface standards − Multimedia databases. Compression and decompression − Data and file format standards − Multimedia I/O technologies − Digital voice and audio − Video image and animation − Full motion video − Storage and retrieval technologies.

MODULE-V: HYPERMEDIA (09)
Multimedia authoring and user interface - Hypermedia messaging -Mobile messaging − Hypermedia message component − Creating hypermedia message − Integrated multimedia message standards − Integrated document management − Distributed multimedia systems. CASE STUDY: BLENDER GRAPHICS Blender Fundamentals – Drawing Basic Shapes – Modelling – Shading & Textures

V. TEXT BOOKS

1. Donald Hearn and Pauline Baker M, “Computer Graphics", Prentice Hall, New Delhi, 2007mDavid Hillman, “Multimedia Technology & Application”, Galgotia Publications, 6th Edition, 2018.
2. Andleigh, P. K and KiranThakrar, “Multimedia Systems and Design‖, PHI, 2003.

VI. REFERENCE BOOKS:

1. Foley, Vandam, Feiner and Hughes, “Computer Graphics: Principles and Practice‖, 2nd Edition, Pearson Education, 2003.
2. Jeffrey McConnell, “Computer Graphics: Theory into Practice‖, Jones and Bartlett Publishers,2006.
3. Judith Jeffcoate, “Multimedia in Practice: Technology and Applications‖, PHI, 1998.

VII. WEB REFERENCES:

1. http://classweb.ece.umd.edu/enee623.F2011/LectureNotes_EE623.pdf
2. https://my.ece.utah.edu/~npatwari/ece5520/lectureAll.pdf

3. https://www.blender.org/support/tutorials/

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech-talk topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. PowerPoint presentation
11. E-Learning Readiness Videos (ELRV)