INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY
DEFINITION AND TERMINOLGY

Course Title	**FUNDAMENTALS OF MULTIMEDIA**				
Course Code	AITC13				
Program	B.Tech				
Semester	V				
Course Type	Elective				
Regulation	UG-20				
Course Structure	Theory			Practical	
	Lecture	Tutorials	Credits	Laboratory	Credits
	3	-	3	-	-
Course Coordinator	Dr. Ravi Kumar Poluru, Assistant Professor , IT				

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

1 COURSE OUTCOMES:

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

CO 1	**Demonstrate** Knowledge and Understanding of the concepts Temporal, Non-Temporal, and Hypertext, Hypermedia	Apply
CO 2	**Describe** integrate audio, visual, and interactive elements into a comprehensive immersive experience.	Understand
CO 3	**Analyze** the ability to extend their basic in Multimedia systems architecture,USB port.	Analyze
CO 4	**Evaluate** Current trends of AR and VR media delivery to propose options to potential clients, and discuss the benefits challenges and misconceptions involved with working in AR and VR.	Evaluate

CO 5	**Evaluate** various interaction schemes common to AR/VR experiences.	Evaluate
CO 6	**Use** immersive effects of visual and audio assets to AR/VR experiences and evaluate implementation methods.	Apply

DEFINITION AND TERMINOLOGY:

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	MODULE I	
	INTRODUCTION TO MULTIMEDIA	
1	**Define Multimedia?**	CO 1
	Multimedia is a combination of text, graphic, sound, animation, and video that is delivered interactively to the user by electronic or digitally manipulated means.	
2	**Classify the Components of Multimedia**	CO 1
	• Text • Graphics • Audio • Video • Animation	
3	**List out the Applications of Multimedia ?**	CO 1
	• Multimedia in Business. • Multimedia in Marketing and Advertising. • Multimedia in Entertainment • Multimedia in Education • Multimedia in Bank • Multimedia in Hospital • Multimedia Pedagogues • Communication Technology and Multimedia Services	
4	**Define Temporal?**	CO 1
	Temporal media is the media form that is linked with time. It is the type of media that changes with time. It is the creation of library of events related to constant time events.	
5	**Define Non Temporal?**	CO 1
	Non-temporal media is the type of media that remains constant and does not rely on time. These remain the same as the time passes by.	
6	**Define Text?**	CO 1
	All multimedia productions contain some amount of text. The text can have various types of fonts and sizes to suit the profession presentation of the multimedia software.	
7	**Define Graphics?**	CO 1
	Graphics make the multimedia application attractive. In many cases people do not like reading large amount of textual matter on the screen. Therefore, graphics are used more often than text to explain a concept, present background information.	
8	**Define Audio?**	CO 1
	A multimedia application may require the use of speech, music and sound effects. These are called audio or sound element of multimedia. Speech is also a perfect way for teaching. Audio are of analog and digital types. Analog audio or sound refers to the original sound signal. Computer stores the sound in digital form. Therefore, the sound used in multimedia application is digital audio.	

9	**Define Video?** It is the technology of capturing, recording, processing, transmitting, and reconstructing moving pictures.Video is more towards photo realistic image sequence / live recording as in comparison to animation.	CO 1
10	**Define Animation?** Animation- Animation is a process of making a static image look like it is moving. An animation is just a continuous series of still images that are displayed in a sequence. The animation can be used effectively for attracting attention. Animation also makes a presentation light and attractive. Animation is very popular in multimedia application.	CO 1
11	**Define Image?** Image is a representation of something or someone or a photograph or an idea you're picturing in your head or the way you or others think of you. An example of an image is a painting of your father. An example of image is a picture taken with a camera and developed. Digital Image = two-dimensional array of pixels of varying color and intensity and Image is based on pixels.	CO 1
12	**Define Hypertext?** Hypertext is text displayed on a computer display or other electronic devices with references (hyperlinks) to other text that the reader can immediately access. Hypertext documents are interconnected by hyperlinks, which are typically activated by a mouse click, keypress set, or screen touch.	CO 1
13	**Define Hypermedia?** Hypermedia, an extension of the term hypertext, is a nonlinear medium of information that includes graphics, audio, video, plain text and hyperlinks. This designation contrasts with the broader term multimedia, which may include non-interactive linear presentations as well as hypermedia.	CO 1
14	**Define Synchronization?** Synchronization in multimedia systems refers to temporal relationships between media objects in the multimedia systems. In future multimedia systems (based, e.g., on MPEG-4) synchronization may also refer to spatial and content relationships, as well as temporal.	CO 1
15	**Define Script?** The script – sometimes also called a storyboard – is the basic building block of. multimedia courseware development. The storyboard is a sequence of simply drawn pictures that visually depict a programme. In preparing interactive multimedia, normally the script is a storyboard.	CO 1
16	**What are the fundamentals of multimedia?**	CO 1
	It including text, images, drawings (graphics), animation, video, sound including speech, and interactivity.	

17	**What is interactivity in multimedia?** Interactive multimedia allows the user to control, combine, and manipulate a variety of media types, such as text, computer graphics, audio and video materials, as well as animation.	CO 1
18	**What is Authoring System?** An authoring system is a program that has pre-programmed elements for the development of interactive multimedia software title. Authoring systems can be defined as software that allows its user to create multimedia applications for manipulating multimedia objects.	CO 1
	MODULE II	
1	**Define Compression?** The definition of compression is the action or state of being squished down or made smaller or more pressed together. When a pile of material is squished together and made smaller and more dense, this is an example of compression.	CO 2
2	**What are different types of compression?** There are two types of compression: lossless and lossy.	CO 2
3	**What is lossless?** Lossless compression doesn't reduce the quality of the file at all. No data is lost, so lossless compression allows a file to be recreated exactly as it was when originally created.	CO 2
4	**What is lossy?** Lossy compression removes some of a file's original data in order to reduce the file size. This might mean reducing the numbers of colours in an image or reducing the number of samples in a sound file. This can result in a small loss of quality of an image or sound file.	CO 2
5	**What is Still Image Compression?** The basis for JPEGs lossy compression is two-dimensional DCT. The image is broken into 8 x 8 blocks on which the transform is computed. Image compression is obtained through quantization of these DCT coefficients to a small set of values. Values are entropy coded and stored as a compressed version of the image.	CO 2
6	**What is JPEG Compression?** JPEG Compression is the name given to an algorithm developed by the Joint Photographic Experts Group whose purpose is to minimize the file size of photo- graphic image files. JPEG compression is a powerful tool, and with great power comes great responsibility.	CO 2
7	**What are primary types of data compression** • File Compression • Media Compression	CO 2

8	**What is Image Compression?** Image compression is the process of encoding or converting an image file in such a way that it consumes less space than the original file. It is a type of compression technique that reduces the size of an image file without affecting or degrading its quality to a greater extent.	CO 2
9	**What is JPEG 2000 compression?** JPEG 2000 is the only standard compression scheme that provides for both lossless and lossy compression. As such, it lends itself to applications that require high-quality images despite limitations on storage or transmission bandwidths.	CO 2
10	**What is Video Compression?** Video compression is the process of reducing the total number of bits needed to represent a given image or video sequence. Video compression is most commonly performed by a program with a specific algorithm or formula for determining the best way to shrink the size of the data.	CO 2
11	**What are two basic compression techniques?** • Interframe • Intraframe	CO 2
12	**What is MPEG-1 in multimedia?** Perhaps the best-known part of the MPEG-1 standard is the first version of the MP3 audio format it introduced.	CO 2
13	**What is MPEG-2 in multimedia?** Image result for MPEG- 1 and 2 Compression in multimedia MPEG is an encoding and compression system for digital multimedia content defined by the Motion Pictures Expert Group (MPEG).	CO 2
14	**What is MPEG-4 video compression?** MPEG-4 is one of the latest video/audio compression method standardized by MPEG group, designed specially for low-bandwidth (less than 1.5MBit/sec bitrate) video/audio encoding purposes. MPEG-4 is designed to deliver DVD-quality video (MPEG-2) at lower data rates and smaller file sizes.	CO 2
15	**What is Audio Compression?** Audio compression may refer to: Audio compression (data), a type of lossy or lossless compression in which the amount of data in a recorded waveform is reduced to differing extents for transmission respectively with or without some loss of quality, used in CD and MP3 encoding, Internet radio, and the like.	CO 2
16	**What is MP3 compression?** MP3 compression works by reducing (or approximating) the accuracy of certain components of sound that are considered (by psychoacoustic analysis) to be beyond the hearing capabilities of most humans. This method is commonly referred to as perceptual coding or as psychoacoustic modeling.	CO 2

MODULE III		
1	**What defines a PC workstation?** A workstation is a computer intended for individual use that is faster and more capable than a personal computer. It's intended for business or professional use (rather than home or recreational use).	CO 3
2	**What is MMX in multimedia?** MMX is a Pentium microprocessor from Intel that is designed to run faster when playing multimedia applications. According to Intel, a PC with an MMX microprocessor runs a multimedia application up to 60 percentage faster than one with a microprocessor having the same clock speed but without MMX.	CO 3
3	**What is I/O system?** Input-output (I/O) systems transfer information between computer main memory and the outside world. An I/O system is composed of I/O devices (peripherals), I/O control units, and software to carry out the I/O transaction(s) through a sequence of I/O operations.	CO 3
4	**Define USB?** A Universal Serial Bus (USB) is a common interface that enables communication between devices and a host controller such as a personal computer (PC) or smartphone. It connects peripheral devices such as digital cameras, mice, keyboards, printers, scanners, media devices, external hard drives and flash drives.	CO 3
5	**What is USB port known as?** The port (also called a socket, jack or receptacle) is the part of your device the USB connector plugs into. USB ports are sometimes referred to as "female", as they accept a "male" connector.	CO 3
6	**What Does IEEE 1394 Interface Mean?** The IEEE 1394 interface is an electronic standard that is used to connect computers. It includes a plug-and-socket connection with a serial bus interface. Up to 63 devices may be connected at the same time with (relatively) high data transfer speeds.	CO 3
7	**What is operating system in multimedia?** Multimedia Operating Systems are the operating systems that can deal with the multimedia files. Multimedia files are different from the traditional files (e.g. texts). They need special considerations for process management, secondary storage management, file management, and so on.	CO 3
8	**What is file system in multimedia?** (1) A file that is capable of holding two or more multimedia elements (text, images, audio, video and animations). See multimedia, multimedia container and metafile. (2) Any file other than one containing only text.	CO 3

9	**What is IO device management?**	CO 3
	Device management in an operating system means controlling the Input/Output devices like disk, microphone, keyboard, printer, magnetic tape, USB ports, camcorder, scanner, other accessories, and supporting units like supporting units control channels.	
10	**What is resource scheduling?**	CO 3
	Resource scheduling is a process used by teams to organize and structure their employees so the tasks they need to complete are scheduled based on availability and capability. Using this process, team leaders can allocate and assign people tasks without over (or under) allocating their schedules.	
11	**What are MMX registers?**	CO 3
	Registers represent arrays of 8 bytes, 4 words, or 2 dwords. Used for high speed, low precision integer vector operations (such as for image and signal processing).	
12	**What are the components of a multimedia PC?**	CO 3
	The various components of multimedia are Text, Audio, Graphics, Video and Animation. All these components work together to represent information in an effective and easy manner.	
13	**What is a multimedia workstation?**	CO 3
	Processor: High core count CPU's capable of handling video editing software, encoding, and rendering duty. Capture and TV Tuner Cards: Capture cards and TV tuners are used to pull in video from external sources. You may or may not need one of these depending on your use case.	
14	**What are the 6 types of multimedia?**	CO 4
	Content of multimedia applications may include data in combinations of the following formats: still images, graphics, motion video, animation, text, numbers, sound, storyline and interface.	
15	**What are the types of IO devices?**	CO 4
	1.CD-R/RW, DVD, and Blu-ray drive. 2.Digital camera. 3.Fax machine. 4.Floppy diskette drive. 5.Hard drives. 6.Modem. 7.NIC (network interface card) 8.SD Card.	
MODULE IV		
1	**What is meant by Multimedia Database Design?**	CO 4
	A Multimedia database (MMDB) is a collection of related for multimedia data. The multimedia data include one or more primary media data types such as text, images, graphic objects (including drawings, sketches and illustrations) animation sequences, audio and video.	
2	**What are the types of multimedia database?**	CO 4
	There are three classes of the multimedia database which includes static media, dynamic media and dimensional media	

3	**What are the components of multimedia database?** This is the multimedia data that is stored in the database such as images, videos, audios, animation etc. 1.Media format data. 2.Media keyword data. 3.Media feature data.	CO 4
4	**What is Content-based multimedia information retrieval?** Content-based multimedia information retrieval (IR) provides new models and methods for effectively and efficiently "searching" through the huge variety of media that are available in different kinds of repositories (digital libraries, Web portals, social networks, multimedia databases, etc.).	CO 4
5	**What is meant by image retrieval?** An image retrieval system is a computer system used for browsing, searching and retrieving images from a large database of digital images.	CO 4
6	**What is image retrieval types?** Image retrieval can be categorized into two types; exact image retrieval and relevant image retrieval.	CO 4
7	**What is content based image retrieval and how does it work?** They are based on the application of computer vision techniques to the image retrieval problem in large databases. Content-Based Image Retrieval (CBIR) consists of retrieving the most visually similar images to a given query image from a database of images.	CO 4
8	**What is video retrieval?** Content based video retrieval is an approach for facilitating the searching and browsing of large image collections over World Wide Web. In this approach, video analysis is conducted on low level visual properties extracted from video frame.	CO 4
9	**What are the challenges to multimedia databases?** 1. Modelling 2. Design 3. Storage 4. Performance 5. Queries and retrieval	CO 4
10	**What is MPEG-7 used for?** MPEG-7, formally named "Multimedia Content Description Inter-face," is the standard that describes multimedia content so users can search, browse, and retrieve that content more efficiently and effectively than they could using today's mainly text-based search engines.	CO 5
11	**What are features of MPEG-7?**	CO 5
	1 Digital library: Image/video catalogue, musical dictionary. 2 Multimedia directory services: e.g. yellow pages. 3 Broadcast media selection: Radio channel, TV channel. 4 Multimedia editing: Personalized electronic news service, media authoring. 5 Security services: Traffic control, production chains	
12	**What is video on demand in database system?** video-on-demand (VOD), technology for delivering video content, such as movies and television shows, directly to individual customers for immediate viewing. In a cable television VOD system, video content is stored on a centralized server in the form of compressed digital files.	CO 5

13	**What are the different types of VOD?**	CO 4
	1.SVOD (Subscription Video on Demand): This is a streaming television model based on subscriptions. 2.TVOD (Transactional Video on Demand): If SVOD is the "open bar," this model is the "cash bar." 3.AVOD (Advertising Video on Demand)	
MODULE V		
1	**What is virtual reality in multimedia?**	CO 5
	Virtual Reality (VR) is a computer-generated environment with scenes and objects that appear to be real, making the user feel they are immersed in their surroundings. This environment is perceived through a device known as a Virtual Reality headset or helmet.	
2	**What is the importance of virtual reality?**	CO 5
	Virtual Reality is a trending technology that gives excellent scope to diverse businesses to take a leap and simulate physical presence in the real world as well as the imaginary world. This immersive technology creates a computer-simulated environment, and the advancements offer cutting-edge solutions.	
3	**What are 3 types of VR?**	CO 5
	There are 3 primary categories of virtual reality simulations used today: non-immersive, semi-immersive, and fully-immersive simulations.	
4	**What is augmented reality interface?**	CO 5
	In augmented reality (AR) interfaces, three-dimensional virtual images appear superimposed over real objects. AR applications typically use head-mounted or handheld displays to make computer graphics appear in the user's environment.	
5	**What is a Teleoperation system?**	CO 5
	Teleoperations, also called telerobotics, is the technical term for the remote control of a robot. In a telerobotic system, a human operator controls the movements of the robot from some distance away	
6	**What do you mean by haptics devices?**	CO 5
	Haptic devices (or haptic interfaces) are mechanical devices that mediate communication between the user and the computer. Haptic devices allow users to touch, feel and manipulate three-dimensional objects in virtual environments and tele-operated systems.	
7	**What is a 3D display called?**	CO 6
	Nowadays the term stereoscopy refers to any 3D display that uses special glasses to present the offset views to each eye; autostereoscopy requires other optical tricks but no such glasses to create the illusion of three dimensionality.	

8	**What is Head-mounted displays?** Head-mounted displays (HMDs) are small displays or projection technology integrated into eyeglasses or mounted on a helmet or hat. Heads-up displays are a type of HMD that does not block the user's vision, but superimposes the image on the user's view of the real world.	CO 6
9	**What is a autostereoscopic display?** Image result for auto-stereoscopic displays, in multimedia Autostereoscopy is any method of displaying stereoscopic images (adding binocular perception of 3D depth) without the use of special headgear, glasses, something that affects vision, or anything for eyes on the part of the viewer.	CO 6
10	**What are holographic displays?** A holographic display is a display that uses coherent light, such as that created by laser, to create a three-dimensional (3D) image in space. True holographic displays create images that conform to the six depth cues by which we recognize 3D views in the real world: Perspective: Objects farther away appear smaller.	CO 6
11	**What is meant by haptic feedback?** Haptic Feedback or "haptics" for short, is the physical action of using a touch screen interface. The feedback part is typically a physical response based upon the user touching the screen, most often a vibration.	CO 6
12	**What is force feedback devices?** Haptic force-feedback devices provide the human operator with tactile cues, adding the sense of touch to existing visual and auditory interfaces. However, the performance enhancements, comfort, and possible musculoskeletal loading of using a force-feedback device in an office environment are unknown.	CO 6
13	**What are the types of haptics?** Five main types of haptic feedback technologies (haptics) are force, vibrotactile, electrotactile, ultrasound and thermal feedback.	CO 6
14	**What are haptic images?** Haptic Image gathers together photographic prints, drawings, collage, assemblage, and paintings, to demonstrate possibilities for mark-making through material. Each of these artists maintains a traditional studio practice: a physical site for the contemplation, production, and iteration of images-as-objects	CO 6
15	**What is stereoscopic display in VR?** Stereoscopic technology creates the illusion of 3D depth using a pair of 2D images. By presenting one image to the left eye, and one to the right, stereoscopy tricks the brain into seeing a 3D image. The pair of images is known as a stereogram	CO 6

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