4MCAEC11: MULTIMEDIA SYSTEMS AND COMMUNICATIONS

Total No. of Hours: 52   **Hours/Week: 04**

Course Objective: To gain knowledge in different medias. Familiarize with various compression schemes, techniques and algorithms

Course Outcome: Students will be able to

CO1: Understand the various multimedia information representations and digitization principle and analyse various multimedia data

CO2: Understand the techniques of text and image compression

CO3: Understand and analyse the various audio and video compression

CO4: Familiarize with the standards of Multimedia communications

CO5: Apply and analyse multimedia techniques in real time applications

Unit I	**Multimedia Information representation**: Introduction, Definition of Multimedia, Digitization principles - Analog signals, Encoder design, Decoder design, Text - Unformatted text, Formatted text, Hypertext, Images - Graphics, digitized documents, digitized pictures, Audio – PCM speech , CD quality audio, synthesized audio. Video - Broadcast television, digital video, PC video, Video Content	10 hrs
Unit II	**Text and Image Compression**: Introduction, compression principles - Source encoders and destination decoders, Lossless and lossy compression, entropy encoding, source encoding. Text compression - static and dynamic Huffman coding, Arithmetic coding, Image compression - Graphics interchange format, Tagged image file format, digitized documents, digitized pictures, JPEG	10 hrs
Unit III	**Audio and Video Compression**: Introduction, Audio compression, Frequency, amplitude, sample rate, Differential pulse code modulation, Adaptive differential PCM, Adaptive predictive coding, Linear predictive coding, code - excited LPC, perceptual coding, MPEG - MP3 audio coders, Dolby audio coders. Video compression principles, video Standards: NTSC, PAL, SECAM, Inter-frame, Intra-frame, video encoding, algorithms H.261, H.263, MPEG, MPEG1, MPEG2, MPEG4, Video for WEB	12 hrs
Unit IV	**Standards for Multimedia communications**: Reference models - TCP/IP, Protocol basics, standards relating to interpersonal communications, Circuit mode networks, Packet - switched networks, Electronic mail, standards relating to interactive applications over the Internet, information browsing, Electronic commerce, intermediate systems, Java and Java Script, Standards for entertainment applications, Movie/Video on demand, Interactive television	10 hrs
Unit V	**Multimedia Applications**: Understanding Designing and implementations of interactive applications, entertainment applications, Multimedia in internet and Web, Video Emails, video conferencing, Web casting, Software for image editing and Compression, Audio editing and compression, Video editing and compression, Voice recognition applications, Gesture based applications, interactive games designing	10 hrs

REFERENCE BOOKS

[1] Fred Halshall, "*Multimedia communication - application, network, protocol and standards, First",* Edition, Pearson Education Ltd, 2009

[2] Ralf Steinmetz, KlaraNahrstedt, "*Media Coding and Content Processing"*, Volume I, PHI,2011

[3] Krishna Kumar, *Multimedia communication*, Dorling Kindersley Publishers, Pearson Education, 2008

[4] Nigel Chapman and Jenny Chapman, *Digital Multimedia*, John Wiley & Sons Ltd, 2009