18ECPE802	MULTIMEDIA COMPRESSION TECHNIQUES	L	T	P	C
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Prerequisite:

1. Signal Processing and basic mathematical analysis skills.

Course objective: Objective of this course is to,

1. Highlight the features of data redundancy and various compression techniques involved.
2. To understand the various challenges involved in text and audio compression.
3. To impart knowledge on various image and video compression techniques.

Unit I INTRODUCTION **9 + 0**

Overview of information theory - Redundancy – Taxonomy of compression techniques – Overview of source coding – Source models - Compression Techniques: Loss less compression - Lossy Compression – Measures of performance - Scalar quantization - Vector quantization - Rate distortion theory - Structure quantizes – Evaluation techniques -Error analysis and methodologies.

Unit II TEXT COMPRESSION **9 + 0**

Huffman coding – Arithmetic coding – Shannon_Fano coding and dictionary techniques – LZW family algorithms – Entropy measures of performance – Quality measures.

Unit III AUDIO COMPRESSION **9 + 0**

Audio compression techniques - Frequency domain and filtering - Basic sub_bands coding - Application to speech coding - G.722 - Application to audio coding - MPEG audio - Progressive encoding for audio – Silence compression - Speech compression techniques – Vocoders.

Unit IV IMAGE COMPRESION **9 + 0**

Predictive techniques – PCM – DPCM - DM - Transform coding - Introduction to JPEG - JPEG-2000 - JBIG standards - Study of EZW - SPIHT algorithms.

Unit V VIDEO COMPRESSION **9 + 0**

Video signal representation – Video compression techniques – MPEG - Motion estimation techniques- Overview of Wavelet based compression and DVI technology - Motion video compression – PLV performance – DVI real time compression.

Total (L+T) = 45 Periods

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1	:	Represent the multimedia data in different formats for various applications.
CO2	:	To understand different coding techniques and apply various algorithms for compression.
CO3	:	To understand the quality and performance of various text and audio compression algorithms.
CO4	:	Apply various image and video compression algorithms for practical applications

Text Books:

1. SayoodKhaleed, "Introduction to data compression", Morgan Kauffman, London, 2006.
2. Gibson J D, Berger T, Lookabaugh T, D. Lindbergh, and R. L. Baker, "Digital Compression for Multimedia: Principles and Standards", Morgan Kaufmann, 1998.

Reference Books:

1. Watkinson J, "Compression in video and audio", Focal press, London,1995.
2. Mark Nelson, "Data compression book", BPB Publishers, New Delhi, 1998.
3. Jan Vozer, "Video compression for multimedia‖, AP 84rofess, NewYork, 1995
4. Peter D. Johnson Jr., Greg A. Harris, D.C. Hankerson, "Introduction to Information Theory and Data Compression", 2nd Edition, Chapman and Hall/CRC, February 26, 2003.

E-References:

1. http://freevideolectures.com/Course/2278/Data-Communication/30
2. http://nptel.ac.in/courses/106105082/30
3. https://www.coursera.org/lecture/algorithms-part2/introduction-to-data-compression-OtmHU