21INT04	INFORMATION CODING THEORY	L	T	P	C
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Course Objectives

- Understand error–control coding.
- Understand encoding and decoding of digital data streams.
- Be familiar with the methods for the generation of these codes and their decoding techniques.
- Be aware of compression and decompression techniques.
- Learn the concepts of multimedia communication.

UNIT I	INFORMATION THEORY	9 Hours

Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

UNIT II	SOURCE CODING: TEXT, AUDIO AND SPEECH	9 Hours

Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT III	SOURCE CODING: IMAGE AND VIDEO	9 Hours

Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

UNIT IV	ERROR CONTROL CODING: BLOCK CODES	9 Hours

Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder - **CRC**

UNIT V	ERROR CONTROL CODING: CONVOLUTIONAL CODES	9 Hours

Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

UNIT VI	LATEST TYRENDS	

Latest Trends

Course Outcomes:

- Design an application with error–control.
- Use compression and decompression techniques.
- Apply the concepts of multimedia communication

Text books:
1. R Bose, "Information Theory, Coding and Crptography", TMH 2007
2. 2. Fred Halsall, "Multidedia Communications: Applications, Networks, Protocols and Standards", Perason Education Asia, 2002.

Reference Books:
1. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 2006
2. S Gravano, "Introduction to Error Control Codes", Oxford University Press 2007
3. Amitabha Bhattacharya, "Digital Communication", TMH 2006

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Course Objective:

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LIST OF EXPERIMENTS	**30 Periods**

Course Outcomes:

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