Course: BTech **Semester:** 6

Prerequisite: -

Rationale: -

Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
Lecture Hrs/	Tutorial Hrs/	Lab Hrs/	Hrs/	Credit	Internal Marks			External Marks		
					T	CE	P	T	P	
3	0	0	-	3	20	20	-	60	-	100

SEE - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

W - Weightage (%) , **T** - Teaching hours

Sr.	Topics	W	T
1	**Compression Techniques** Loss less compression, Lossy Compression, Measures of performance, Modeling and coding, Mathematical Preliminaries for Loss-less compression: A brief introduction to information theory, Models: Physical models, Probability models, Markov models, com-posite source model, Coding: uniquely decodable codes, Prefix codes.	10	15
2	**Huffman coding algorithm** Minimum variance Huffman codes, Adaptive Huffman coding: Update procedure, Encoding procedure, Decoding procedure. Golomb codes, Rice codes, Tunstall codes, Applications of Hoffman coding: Loss less image compression, Text compression, Audio Compression..	5	10
3	**Arithmetic Coding** Coding a sequence, Generating a binary code, Comparison of Binary and Huffman coding, Applications: Bi-level image compression- The JBIG standard, JBIG2, Image compression. Dictionary Techniques: Introduction, Static Dictionary: Diagram Coding, Adaptive Dictionary. The LZ77 Approach, The LZ78 Approach, Applications: File Compression-UNIX compress, Image Compression: The Graphics Interchange Format (GIF), Compression over Modems: V.42 bits, Predictive Coding: Prediction with Partial match (ppm): The basic algorithm, The ESCAPE SYMBOL, length of context, The Exclusion Principle, The Burrows-Wheeler Transform: Move to- front coding, CALIC, JPEG-LS, Multi-resolution Approaches, Facsimile Encoding, Dynamic Markoy Compression.	20	15
4	**Scalar Quantization** Distortion criteria, Models, Scalar Quantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, Non uniform Quantization.	15	10
5	**Vector Quantization** Advantages of Vector Quantization over Scalar Quantization, The Linde-Buzo-Gray Algorithm Tree structured Vector Quantizers. Structured Vector Quantizers.	15	10

Reference Books

1.	**The Data Compression book** By Mark Nelson | Jean Loup Gaily
2.	**Data Compression : The Complete Reference** By David Saloman | Springer
3.	**Introduction to Data Compression** By Khalid Sayood | Morgan Kaufmann Publishers