

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

INFORMATION TECHNOLOGY

Subject Name: **DATA COMPRESSION**

Sr. No.	Course Contents	Total Hrs
1.	Introduction To Data Compression The Audience, Why C?, Which C?, Keeping Score, The Structure	02
2.	The Data Compression Lexicon, With A History The Two Kingdoms, Data Compression = Modeling + Coding, The Dawn Age, Coding An Improvement Modeling, Statistical Modeling, Ziv & Lempel LZ77 LZ78, Lossy Compression, Programs to Know	06
3.	The Dawn Age: Minimum Redundancy Coding The Sahnnon-Fano Algorithm, The Huffman Algorithm, Huffman in C, BITIO.C, A Reminder about Prototypes, MAIN-C.C & MAIN-E.C, MAIN-C.C, ERRHAND.C, Into the Huffman Code, Counting the Symbols, Saving the Counts, Building the Tree, Using the Tree	06
4.	A Significant Improvement: Adaptive Huffman Coding Adaptive Coding, Updating the Huffman Tree, What swapping Does, The Algorithm, An Enhancement, The Escape Code, The Overflow Bonus, A Rescaling Bonus, The Code, Initialization of the Array, The Compress Main Program, The Expand Main Program, Encoding the Symbol, Decoding The Symbol	08
5.	Huffman One Better: Arithmetic Coding Difficulties, Arithmetic Coding: A Step Forward, Practical Matters, A Complication, Decoding, Where's the Beef	08
6.	Dictionary-Based Compression An Example, Static vs. Adaptive, Adaptive Methods, A Representative Example, Israeli Roots, History, ARC: The Father of MS-DOS Dictionary Compression, Dictionary Compression, Danger Ahead-Patents, Conclusion	06
7.	Sliding Window Compression The Algorithm, Problems with LZ77, An Encoding Problem, LZSS compression, Data structures, A balancing Act Greedy vs. Best Possible. The Expansion Routine, Improvements.	08
8.	Speech Compression Digital Audio Concepts, Fundamentals, Sampling Variables, PC-Based sound, Lossless Compression of Sound, Problems and Results, Loss compression, Silence Compression, Other Techniques.	06
9.	Lossy Graphics Compression Enter Compression, Statistical And Dictionary Compression Methods Lossy Compression Differential Modulation Adaptive Coding, A Standard That Works: JPEG, JPEG Compression, The Discrete Cosine Transform, DCT Specifics, Why Bother? Implementing The DCT. Matrix Multiplication, Cpmtomied Improvements, Output Of The DCT, Quantization, Selecting A Qualtization Matrix. The Sample Program, Input Format, Initialization, The Forward DCT Routine, Write DCT Data(), File Expansion, Read DCT Data(), The Inverse DCT.	10

Text Books:

1. "Data Compression", Mark Nelson
2. "Data Compression", Khalid shayood, Morgon Kaufmann

Reference Books:

1. "Data Compression : The Complete Reference", David Saloman, Springer

