**SEMESTER V**
**INFORMATION THEORY & CODING**

( COMMON FOR ECE, ETCE & IT )

**UNIT-I: SOURCE CODING** **9**

Mathematical model for information source: - Mutual Information - Discrete Entropy-Definition and properties - Joint and conditional entropies - Entropy in the continuous case - Unique decipherability and instantaneous codes - Kraft inequality.

**UNIT-II: NOISY CODING** **9**

Discrete memory less channel - Classification of channels & channel capacity - Calculation of channel capacity - Decoding schemes - Fano"s inequality - Shannon's fundamental theorem - Capacity of a band limited Gaussian channel.

**UNIT-III**: **CHANNEL CODING** **9**

Channel models: Binary Symmetric channels - Information capacity theorem - Implication of the information capacity theorem - Information capacity of coloured noise channel - Rate distortion theory - Data compression.

**UNIT-IV**: **ERROR CONTROL CODING** **9**

Linear block codes: - Cyclic codes, BCH Codes, RS codes, Golay codes, Burst error correcting codes, Interleaved codes, Convolutional codes : Convolutional encoder, code tree, state diagram, trellis diagram - Turbo codes.

**UNIT-V**: **DECODING OF CODES** **9**

Maximum likelihood decoding of convolutional codes - Sequential decoding of convolutional codes- Applications of Viterbi decoding.

**TOTAL HOURS: 45**

**TEXT BOOKS:**

1.S.P.Eugene Xavier, "Statistical Theory of Communication", New Age International, Reprint 2001
2,Richard B.Wells, "Applied Coding & Information Theory for Engineers",LPE,Pearson Education,1999

**REFERENCE BOOKS:**

1.Simon Haykin, "Communication Systems", John Wiley & Sons, Inc, Newyork, 3rd Edition.
2.John G.Proakias, "Digital Communication", McGraw Hill, Singapore, 4th Edition,2001.
3.Hwei P Hsu, "Theory of Analog and Digital Communication", Pearson / Prentice Hall
4.Shu Lin& Daniel J. Costello, "Error control coding Fundamentals and applications", Pearson Education 2nd edition