

Module No.	Unit No.	Topics	Hrs.
<b>1.0</b>		<b>Information Theory and Source Codes</b>	<b>05</b>
	<b>1.1</b>	Block diagram of digital communication system, Information content of a source symbol, Source entropy, Average information rate, AWGN channel, and Shannon-Hartley channel capacity theorem.	03
	<b>1.2</b>	Introduction of source code, Huffman code, Shannon-Fano code.	02
<b>2.0</b>		<b>Error Control System and Error Detection Codes</b>	<b>03</b>
	<b>2.1</b>	Introduction of error control system, Automatic Retransmission Query (ARQ) system, Types of ARQ systems and comparison, Forward error correction (FEC) system. Comparison between FEC and ARQ.	01
	<b>2.2</b>	Error detection codes: Vertical Redundancy Check (VRC) code, Longitudinal Redundancy Check (VRC) code, Cyclic Redundancy Check (CRC) code and Checksum code.	02
<b>3.0</b>		<b>Error Correction Codes</b>	<b>10</b>
	<b>3.1</b>	Linear block code: Code generation, calculation of minimum Hamming distance, error detection capability, error correction capability, implementation of encoder, error detection, syndrome table, error correction and implementation of decoder.	03
	<b>3.2</b>	Cyclic code: Code generation, calculation of minimum Hamming distance, error detection capability, error correction capability, implementation of encoder, error detection, syndrome table, error correction and implementation of decoder.	03
	<b>3.3</b>	Convolutional code: Generation, path responses, encoder, state transition table, state diagram, tree diagram, trellis diagram, decoding using Viterbi's algorithm.	04
<b>4.0</b>		<b>Baseband Transmission</b>	<b>05</b>
	<b>4.1</b>	Block diagram of baseband transmitter-receiver system, Line codes (RZ and NRZ UniPolar formats, RZ and NRZ Polar formats, NRZ Bipolar format (AMI format), NRZ Manchester format, and Quaternary Polar format). Comparison of line codes with respect to bandwidth, power requirement, synchronization capability, DC level, polarity inversion error and complexity. Power spectral density and spectrum of NRZ Unipolar and Polar formats.	03
	<b>4.2</b>	Inter Symbol Interference (ISI), Inter Channel Interference (ICI). Nyquist criterion for distortionless baseband binary transmission, Nyquist bandwidth and practical bandwidth.	02
<b>5.0</b>		<b>Optimum Detection of Baseband Signal</b>	<b>04</b>
	<b>5.1</b>	Matched filter, Output SNR, Transfer function, Impulse response and Error probability. Integrate and dump receiver, Correlator receiver.	04
<b>6.0</b>		<b>Digital Modulations</b>	<b>12</b>
	<b>6.1</b>	Generation, Detection, Error probability (using signal space representation and Euclidean distance), Bandwidth (using PSD and spectrum except for MSK) and applications of the following modulations: Binary ASK, Binary PSK, Quadrature PSK, Off-Set QPSK, M-ary PSK, Binary FSK, M-ary FSK, 16-ary QASK and MSK.	12
		<b>Total</b>	<b>39</b>