Lecture Plan for Information Theory & Coding (EC-031)

Faculty : Shrish Bajpai

Section : Final Year

Web Page : http://sbajpai.yolasite.com/information-theory-and-coding.php

Course Objective : Objective is this course is to give a overview of the digital communication and introduction of error control codes used in the digital communication.

Lecture	Topic	Reference Book
1.	Introduction to the Information Theory & Coding	1,2
2.	Discrete messages, Sampling Theorem	1
3.	Entropy and it's type with it's mathematical expression	1
4.	Information rate, & bit rate/baud rate, coding to increase average information per bit	1
5.	Shannon fanon algorithm & Hoffman coding and it's mathematical problems	1,2
6.	Shannon & Hoffman mathematical problems	1,2
7.	Shannon theorems & channel capacity and it's mathematical problem	1
8.	Capacity of Gaussian channel, bandwidth & S/N trade-off	1
9.	Efficiency of orthogonal signal transmission	1
10.	Mathematical problems of Unit 1	1
11.	Introduction to coding, error detecting & correcting codes and it's mathematical problems-1	1
12.	Introduction to coding, error detecting & correcting codes and it's mathematical problems-2	1
13.	Concepts of codes, length, minimum distance & weight	1
14.	Binary symmetric channels, equivalence of codes & type of Error Correcting Code	1,2
15.	Block codes, perfect codes, ISBN & bar codes	1
16.	Linear codes, encoding and decoding with a linear code	1,2
17.	Error correction, parity bit, parity check matrix, syndrome decoding & hamming codes	1,2
18.	Cyclic codes & cyclic redundancy check,	1,2
19.	Convolution coding & decoding	1,2
20.	Probability of error of convolution codes & orthogonal codes.	1,2
21.	Mathematical problems of Unit 2 & 4	1,2
22.	Mathematical problems of Unit 2 & 4	1,2

23.	Mathematical problems of Unit 2 & 4	1,2
24.	Mathematical problems of Unit 2 & 4	1,2
25.	Auto & cross correlation functions and it's properties	2
26.	Generation algorithm of Prime	
27.	Quasi prime codes & optical orthogonal codes	1
28.	Decoding schemes & S/N performance	1
29.	Automatic repeat request(ARQ) schemes	1
30.	Data compression codes	1
31.	Data encryption and decryption	1
32.	Mathematical problems of Unit 3	1
33.	Application of information theory and optimum modulation system	1
34.	Comparison of AM system with the optimum system	1
35.	Comparison of F.M with the optimum system,	1
36.	Comparison of PCM and FM & Feedback communication	1
37.	Trellis decoded modulation & it's mathematical problem	1
38.	Mathematical problems on Trellis decoded modulation	1
39.	Mathematical problems of Unit 5	1
40.	Mathematical problems of Unit 5	1

1. Taub and Schilling, Second Edition, Principles of communication systems, Tata McGraw Hill Publication, India
2. Bernard Sklar, Digital Communication Fundamentals and Application, Second Edition, Pearson Publication, India