Principles of Digital Communications

Electrical Engineering

Instructor Name: S N Merchant
Institute: IIT Bombay
Department: Electrical Engineering

Course Intro: : The course is an introduction to modern digital communications at a senior undergraduate level. The primary goal of the course is to provide the student an understanding of the principles, techniques, trade-offs, and fundamental limits in modern digital communication systems. This course introduces the fundamentals of digital signaling, information theory and coding, digital transmission and reception

Pre Requisites: : Signals and Systems, Basic Probability and Random variables
Core/Elective: : Core
UG/PG: : UG
Industry Support : Qualcomm, Samsung, BEL, ISRO, DRDO labs, communication companies

Reference : Digital Communications, 5th Ed, John G Proakis and Masoud Salehi, McGraw Hill, 2007/2008

About Instructor: Dr. Shabbir N. Merchant received his B. Tech, M. Tech, and PhD degrees all from Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai. Currently he is a Professor in Department of Electrical Engineering at IIT Bombay. He has more than 35 years of experience in teaching and research. He has made significant contributions in the field of signal processing and its applications. His noteworthy contributions have been in solving state of the art signal and image processing problems faced by Indian defence. His broad area of research interests are wireless communications, wireless sensor networks, signal processing, multimedia communication, and image processing and has published extensively in these areas. He is a co-author with his students who have won Best Paper Awards. He has served on Technical Program Committees of many IEEE premier conferences.

COURSE PLAN

SL.NO	Week	Module Name
1	1	Introduction I
2	1	
3	1	
4	1	
5	1	
6	2	Source Coding Theorem II
7	3	Mutual Information I
8	4	Signal Space Representations II
9	5	Optimum Receiver I
10	6	Quantizer Design I
11	7	Quantizer Design VI
12	8	Pulse Shaping I
13	9	Equalization II
14	10	Digital Modulation Methods V
15	11	Digital Modulation Methods X
16	12	Error Control Coding I