



PRINCIPLES OF DIGITAL COMMUNICATION

PROF. ABHISHEK DIXIT

Department of Electronics and Communications Engineering
IIT Delhi

TYPE OF COURSE : Rerun | Elective | UG

COURSE DURATION : 12 weeks (24 Jan' 22 - 15 Apr' 22)

EXAM DATE : 23 Apr 2022

PRE-REQUISITES : Basic idea of Signals and Systems, and probability theory

INTENDED AUDIENCE : Electronics and Communications Engineering students and professionals

INDUSTRIES APPLICABLE TO : Telecommunication Industry, e.g., Qualcomm, Ericson, Huawei

COURSE OUTLINE :

Digital communication is a fundamental course in the electronics and communication stream. The objectives of this course is to introduce the basic principles that underlie the analysis and successful design of a digital communication system. Digital communication systems have been used in all modern communication systems. Emphasis is placed on understanding system design goals and to optimize the tradeoff among basic system parameters such as signal-to-noise ratio, bandwidth, etc.

ABOUT INSTRUCTOR :

Prof. Abhishek Dixit, M.Tech. (IITD: 2010) and Ph.D. (Ghent University, Belgium: 2014) Professor Abhishek Dixit is working with the Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi (India) since December 2015. His research interests pertain to the domains of digital communications, error control codes, optical communications, optical networks, optical wireless communication links and networks, and fiber-wireless converged networks.

COURSE PLAN :

Week 1: Introduction to digital communications

Week 2: Geometric representation of signals

Week 3: Review of random variables

Week 4: Review of random process

Week 5: Review of random process

Week 6: Waveform coding

Week 7: Modulation - I

Week 8: Modulation - II

Week 9: Modulation - III

Week 10: Hypothesis testing

Week 11: Performance analysis of binary and M-ary signaling schemes

Week 12: Performance analysis of non-coherent communication