

TCET/FRM/IP-02/09

Semester Plan
(Theory)

Revision: A

Semester: V

Course: ETRX

Subject: DIGITAL COMMUNICATION

Class: TE-----ETRX

Sr.No.	Prerequisite/ Bridge course:			Duration (Week /Hrs)	Modes of Learning	Recommended Sources	
1	Prerequisite Course: probability and vector calculus EXC 504: signal and systems Bridge course:principles of communication II			3 hours	Self Learning/ Revision	Textbooks: 1. Lan A. Glover and Peter M. Grant, "Digital Communications" 2. Amitabha Bhattacharya, "Digital Communication"	
Sr. No	Module No.	Lesson No	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1	Module 1	L1.1	Subject orientation, lecture plan and Prerequisites discussion Need of Data structures	Chalk & Board,	10-07-2017	1.2.1,	
2	Module 1	L1.2	OBE, MODULE1:Application of Probability Theory in Communication Systems Types of Data structures : Linear and non linear data structures Arrays	Chalk & Board,	11-07-2017	1.7.2	
3	Module 1	L1.3	Basic probability theory discussion Introduction to digital communication system, significance of AWGN channel, pulse dispersion in the channel	Chalk & Board,	12-07-2017	1.7.3	
4	Module 1	L1.4	Introduction to probability and sample space , Baye's rule, conditional probability (Abstract Data type).Introduction to	Chalk & Board,	13/7/2017	1.7.4	
5	Module 1	L1.5	statistical independence, random variables, probability functions, mean and variance of random variables and sum of random variables	Chalk & Board,	14/07/2017	1.7.5	
6	Module 1	L2.1	Probability Models: Binomial Distribution, Poisson Distribution, Gaussian PDF	Board, Animation	17-07-2017	1.7.5	
7	Module 1	L2.2	Rayleigh PDF and Rician PDF, Central-Limit Theorem	Chalk & Board,	19-07-2017	1.7.5	
8	Module 1	L2.3	Binary Synchronous Channel(BSC), development of optimal receiver	Chalk & Board,	19/07/17	2.7	
9	Module 2	L.2.4	Measure of Information, Entropy, Information rate, Channel capacity	Chalk & Board,	20/07/17	2.8	
10	Module 2	L.3.1	Capacity of a Gaussian channel, bandwidth, S/N trade-off	Chalk & Board,	24-07-2017	2.9	
11	Module 2	L.3.2	Shannon's source coding	Chalk & Board,	25-07-2017	2.9	

12	Module 2	L.3.3	Coding to increase the average information per bit, Huffman coding	Chalk & Board,	26-07-2017	2.9	
13	Module 2	L.3.4	Lempel Ziv coding, examples	Chalk & Board,	26-07-2017	2.9	
14	module1&2	L.3.5	revision	Chalk & Board,	29/7/17		
15	Module 2	L.4.1	and applications of source coding	Chalk & Board,	31-07-2017	3.7	
16	Module 3	L.4.2	Line codes and their desirable properties, PSD of digital data.	Chalk & Board,	01-08-2017	3.8	
17	Module 3	L.4.3	Line codes continued	Chalk & Board,	02-08-2017	3.9	
18	Module 3	L.4.4	Baseband PAM transmission: Concept of inter channel and inter symbol interference,	Chalk & Board,	02-08-2017	3.10	
19	Module 2&3	L 4.5	Doubt solving session and revision	Chalk & Board,	05-08-2017		
20	Module 3	L.5.1	Eye pattern	Chalk & Board,	07-08-2017	3.11	
21	Module 3	L.5.2	Concept of equalizer to overcome ISI	Chalk & Board,	08-08-2017	3.12 and 3.13	
22	Module 3	L.5.3	Nyquist's Criterion for distortion less	Chalk & Board,	09-08-2017	4.8.1	
23	Module 3	L.5.4	Duo-binary encoding and modified duo-binary encoding	Chalk & Board,	09-08-2017	4.8.1	
24	Module 4	L6.1	Digital modulation formats, coherent and non-coherent reception	Chalk & Board,	14-08-2017	4.8.2 and 4.8.3	
25	Module 4	L6.2	Binary modulation techniques:, BFSK , BASK	Chalk & Board,	16-08-2017	4.8.3	
26	Module 4	L6.3	BPSK	Chalk & Board,	16-08-2017	4.8.4	
27	Module 3	L6.4	revision	Chalk & Board,	19-08-2017		
28	Module 4	L.8.1	M-ary Modulation techniques: QPSK, M-ary PSK,	Chalk & Board,	30-08-2017	4.8.5	
29	Module 4	L.8.2	MSK , M-ary FSK,	Chalk & Board,	30-08-2017	4.8.6	
30	Module 3	L 8.3	revision	Chalk & Board,	09-02-2017		

31	Module 4	L.9.1	Differential encoded BPSK & D-QPSK ,mary QAM	Chalk & Board,	04-09-2017	4.8.6	

32	Module 4	L.9.2	Optimal Reception of Digital Data	Chalk & Board,	05-09-2017	4.8.7	
33	Module 4	L.9.3	baseband signal receiver and its and Probability of error	Chalk & Board, Animation	06-09-2017	5.8.1	
34	Module 4	L 9.4	Optimum receiver and its transfer function, matched filter and its properties	Chalk & Board, Animation	06-09-2017	5.8.2	
35	Module 5	L 10.1	Need for channel encoding, discrete memory-less channel , redundancy,	Chalk & Board,	11-09-2017	5.8.3	
36	Module 5	L 10.2	code rate ,code efficiency and hamming bound	Chalk & Board,	12-09-2017	5.8.4	
37	Module 5	L 10.3	Linear block codes,	Chalk & Board,	13-09-2017	5.8.5	
38	Module 5	L 10.4	cyclic codes, block interleaving	Chalk & Board,	13-09-2017	5.8.8	
39	Module 4,5,6	L 10.5	revision		16-09-2017		
40	Module 5	L 11.1	Convolution codes: State diagram,	Chalk & Board,	18-09-2017	5.8.6	
41	Module 5	L 11.2	code tree, trellis diagram	Chalk & Board,	19-09-2017	5.9	
42	Module 5	L 11.3	Decoding of Convolutional codes using Viterbi algorithm	Chalk & Board,	20-09-2017	5.14	
43	Module 5	L 11.4	Numerical related to this module	Chalk & Board,	20-09-2017	5.15	
44	Module 6	L12.1	Need for spread spectrum modulation, pseudo noise sequence generation	Chalk & Board,	25-09-2017	5.15	
45	Module 6	L12.2	Need for spread spectrum modulation, pseudo noise sequence generation (continued)	Chalk & Board,	26-09-2017	6.6	
46	module 4,5,6	L12.3	mcq test,revision	Chalk & Board,	30-09-2017		
47	Module 6	L13.1	direct-sequence spread spectrum (DSSS)	Chalk & Board,	03-10-2017	6.6.1	
48	Module 6	L13.2	Processing gain and jamming margin,	Chalk & Board,	04-10-2017	6.6.1	
49	Module 6	L13.3	frequency-hop spread spectrum	Chalk & Board,	04-10-2017	6.6.2 6.6.8	
50	Module 6	L 15.1	Application of spread spectrum : DS-CDMA	Chalk & Board,	16-10-2017	6.6.8	
Remark:		Syllabus Coverage:		Practice Session:		Beyond Syllabus: detailed study of the spectrum of transmission signal	
Course:							
No. of (lectures planned)/(lecture taken): 50 /							

Advanced course: PRINCIPLES OF COMMUNICATION II	20 Hours	Online videos : nptel.ac.in/courses/108102045/ Web sources: 1. NPTEL- https://onlinecourses.nptel.ac.in Textbook reference: 1. Lan A. Glover and Peter M. Grant, “Digital Communications”
--	----------	---

Textbook:

1. *Principle of communication by taub and schilling*
2. Probability and statistics by Murray
3. Communication Sysytem by Prokasis

Reference book:

Amitabha Bhattacharya, “Digital Communication”, Tata Mcgraw Hill

4. Lan A. Glover and Peter M. Grant, “Digital Communications”, Pearson, 2nd Ed.

Digital Reference:

- 3.1 www.nptel.ac.in
- 3.2 www.tutorialpoint.com

NAME & SIGNATURE OF FACULTY

SIGNATURE OF HOD

SIGNATURE OF PRINCIPAL/DEAN (ACADEMICS)

DATE

DATE:

DATE:

Note

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.