GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering Syllabus

Subject Code : 3720402

Subject Name : Advanced Digital Communication

WEF Academic Year :	2023 - 24
Semester :	2
Category of the Course :	Core

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Course Content :

Sr. No.	Course Content	No. of Hours
1	Review of probability and Stochastic Processes.	6
2	Characterization of Communication Signal and System. GeometricRepresentation of Signals and its use in communication.	8
3	Optimum receiver for Additive White Gaussian Noise, BER calculation.	10
4	Carrier and symbol synchronization, signal design for Band LimitedChannels.	10
5	Communication through Band limited Channel, concept of parallel transmission, Multi channel and multi carrier CDMA system, fading multi- path channel, OFDM, Future trends.	12
	Total	**46**

Reference Book :

1. Proakis J.J.,D Wozencraft J.M. and Jacobs I.M., Principles of CommunicationEngineering, John Wiley.
2. Carison A., Communication System, 3rd ., McGraw Hill.
3. Van Trees H.L., Detection Estimation and Modulation Theory, Vol. 1., Wiley.
4. Blahut R.F., Digital transmission of Information, Addison Wesley.
5. Benedetto S., Biglieri E. and Castellari V., Digital Transmission Theory, PrenticeHall.

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**20**	**30**	**20**	**10**	**10**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note : This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome :
After Completion of the Course, Student will able to :

No.	Course Outcomes	Weightage %
01	Understand the concept of Random Variable and Process.	20
02	Characterize Communication Signal and System.	30
03	Design signal for Band Limited Channels.	25
04	Explain Multichannel and Multi carrier communication system.	25

List of Laboratory/Learning Resources Required :

1. Experiments/Program based on ASK.
2. Experiments/Program based on FSK.
3. Experiments/Program based on PSK.
4. Experiments/Program based on QPSK.
5. Experiments/Program based on CDMA.
6. Experiments/Program based on MIMO OFDM.
7. Experiments/Program based on RAKE Receiver.
8. Study and comparison of various modulation techniques based on BER.
9. Study and write program code for Optimum receiver for Additive White Gaussian Noise
10. Study various fading techniques in multi path channel.

List of Open Source Software/learning website :

1. NPTEL online course: https://onlinecourses.nptel.ac.in/
2. Matlab/Scilab

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