GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor/Master of Engineering Syllabus

Subject Code : ME02004021

Subject Name : Advanced Digital Communication

WEF Academic Year :	2024-25
Semester :	2
Category of the Course :	PCC-04

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	% of Weightage
1	Review of probability and Stochastic Processes	6	14
2	Characterization of Communication Signal and System. GeometricRepresentation of Signals and its use in communication	8	18
3	Optimum receiver for Additive White Gaussian Noise, BER calculation.	10	22
4	Carrier and symbol synchronization, signal design for Band LimitedChannels.	10	22
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	24
	Total	**46**	**100**

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.

Course Outcome :

After Completion of the Course, Student will able to :

No	Course Outcomes	RBT Level*
01	Understand the concept of Random Variable and Process.	UN

02	Characterize Communication Signal and System.	AN
03	Design signal for Band Limited Channels.	CR
04	Explain Multichannel and Multi carrier communication system.	UN

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List :

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 Laboratory/Learning Resources Required :

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

* * * * * * *