MOHAMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

			LES	SON PL	AN					
		Depar	tment of Electronic	es and Cor	nmunicatio	n Engine	ering			
Na	ame of the Subject	Wireless communication			me of the ng Faculty	S.ANUSU	YA			
Su	bject Code	EC8652		Ŋ	ear / Sem I	III/VI				
	Acad Year	2021-2022			Batch 2	2020-2023	}			
			Cour	rse Obje	ctive					
1)Know	the charac	teristic of wireless channel								
2) Learn	the variou	s cellular architectures								
3) Under	stand the	concepts behind various digital signaling so	chemes for fading c	hannels						
4) Be far	niliar the v	various multipath mitigation techniques								
5) Under	rstand the	various multiple antenna systems								
			Cour	rse Outc	ome					
CO1:Enu	ımerate th	e types of wireless channels								
CO2:Inte	erpret the c	oncepts in various Multiple access techniq	ues							
CO3:Des	sign a cellu	lar system								
CO4:Apj	ply the cor	cepts behind various digital signalling scho	emes,Compare mul	tipath mit	igation tech	nniques a	nd analyze their p	erformanc	e	
CO5:Des	sign and in	nplement systems with transmit/receive div	ersity and MIMO s	systems an	ıd analyze t	their perf	ormance			
			L	esson Plai	n					
Sl. No.		Topic(s)	T / R*	Periods Required	Mode of To (BB / PPT / / MOOC	/ NPTEL	Blooms Level (L1-L6)	со	PO	
			UNIT I-WIR	ELESS (
	Introduc	tion of wireless Communication	T1				T 1			
1	Systems			1	BB		L1	CO1	PO1, PO2,	
2		ale Fading and Free Space	T1,T2	1	BB		L2	CO1	PO1, PO2,PO3, PO6	
3	<u> </u>	Ground Reflection Model	T1,T2	1	BB		L2	CO1	PO1,PO2	
4		dget design using Path loss models	T1,T2	1	BB	3	L3	CO1	PO1,PO2,PO3	
5		ale fading- Factors,	T1,T2	1	BB	B L1		CO1	PO1,PO2,PO3	
6		persion parameters – Power delay ms delay spread, excess delay, mean elay	T1,T2	1	ВВ	3	L2	CO1	PO1,PO2,PO3,PO5	
7		ers of mobile multipath channels, ce bandwidth – Doppler spread & ce time,	L2	CO1	PO1,PO2					
8	Fading d flat fadir	ue to Multipath time delay spread – ag – frequency selective fading	T1,T2	1	ВВ	3	L2	CO1	PO1,PO2,,PO4,PO12	
9	Fading due to Doppler spread – fast fading – slow fading. T1 1 BB L2 CO1 PO1,PO2,PO5,PO12									
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any Tutorial Evaluation method: MARKS WILL BE GIVEN FOR THEIR SOLUTION										
	1		UNIT II-CELLU	LAR AF	RCHITEC	CTURE				
10	Multiple	Access techniques	T1	1	BB	3	L2	CO2	PO1,PO2	
11	FDMA a	nd TDMA	T1	1	BB	3	L2	CO2	PO1,PO2	
12	CDMA		T1	1	ВВ	3	L4	CO2	PO1,PO2,PO5	

13	Cellular concept- Frequency reuse	T1,T2	1	BB	L2	CO3	PO1,PO2,PO4,PO12
14	Channel assignment	T1,T2	1	BB	L2	CO3	PO1,PO2
15	hand off- interference	T1,T2	1	BB	L2	CO3	PO1,PO2,PO3,PO6
16	Capacity calculations	T1,T2	1	BB	L3	CO3	PO1,PO2,PO3
17	system capacity- trunking & grade of service	T1,T2	1	BB	L3	CO3	PO1,PO2,PO3
18	Coverage and capacity improvement.	T1	1	BB	L2	CO3	PO1,PO2,PO3

Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Survey Type priojects: Compare multiuser detection schemes for CDMA communications. Evaluate whether

they are appropriate for mobile, wireless communications

Evaluation method: MARKS WILL BE GIVEN FOR THEIR REPORT

	UNIT III-DIGITAL SIGNALING FOR FADING CHANNELS										
19	Introduction about modulation and Fading Channels	Т1	1	ВВ	L2	CO4	PO1,PO2				
20	Structure of a wireless communication link- Transceiver block structure and simplified models	T1,T2	1	ВВ	L1	CO4	PO1,PO2				
21	Principles of π/4 Quadrature Phase Shift Keying	T1,T2	1	ВВ	L2	CO4	PO1,PO2,PO4				
22	Principles of offset Quadrature Phase Shift Keying	T1,T2	1	ВВ	L2	CO4	PO1,PO2,PO4				
23	Minimum Shift Keying and Gaussian Minimum Shift Keying)	T1,T2	1	ВВ	L2	CO4	PO1.PO2.PO4				
24	Error performance in fading channels- Average BER- classical computation method, alternative method	T1,T2	1	ВВ	L3	CO4	PO1,PO2,PO3,PO4				
25	Principle of Orthogonal Frequency Division Multiplexing, Implementation of Transceivers, MC-CDMA system	T1,T2	1	ВВ	L3	CO4	PO1,PO2,PO3,PO4,PO5,PO12				
26	Cyclic Prefix and Windowing	T1	1	ВВ	L2	CO4	PO1,PO2,PO3				
27	PAPR- origin of PAPR and PAPR reduction techniques	T1,R2	1	ВВ	L2	CO4	PO1,PO2				

Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any QUIZ

Evaluation method :GOOGLE FORM

UNIT IV-MULTIPATH MITIGATION TECHNIQUES										
28	Introduction to Equalisation- Adaptive equalization-	PO1								
29	Zero forcing and LMS algorithms and RLS Algorithm	T1,T2	1	BB	L2	CO4	PO1,PO2,PO3,PO4			
30	Linear Equalization	T1,T2	1	ВВ	L2	CO4	PO1,PO2,PO3			
31	Nonlinear equalization- Decision feedback and MLSE equalisation	T1,T2	1	ВВ	L4	CO4	PO1,PO2,PO3,PO5			
32	Diversity- Microdiversity- Spatial, temporal, frequency, angle and polaristion diversity	T1,T2	1	ВВ	L2	CO4	PO1,PO2			
33	Macrodiversity	T1,T2	1	ВВ	L2	CO4	PO1,PO2			
34	Diversity combining techniques- Selection, switched maximal ratio combining diversity	T1,T2	1	BB	L2	CO4	PO1,PO2			

	Error pro	obability in fading channels	with									
35 d	diversity	reception- Error probability	in flat	T1,7	Γ2 1	1	ВВ	В	1	.3		
		hannels and SER in frequence	у								CO4	PO1,PO2,PO3,PO6
36	RAKE r	eceiver Assignment / Case Studies / Tu		T1,		1	В			.2	CO4	PO1,,P012
Min	ni project:S	imulate various adaptive equalismulate various adaptive equalismulation output	lization scho	emes.	_							
			UNI	T V-MUI	LTIPLE	ANTE	NNA TEC	CHNIQU	JES			
37	Introduc	tion to MIMO systems		T1,7	Т2	1	В	В	1	.2	CO5	PO1
38	Spatial N	Multiplexing and system mod	del	T1,7	Т2	1	В	В]	.2	CO5	PO1,PO2
39	Precodin	ng		T1,7	Т2	1	В	В	1	.1	CO5	PO1
40	Beam fo	orming		T1,7	Т2	1	В	В]	.1	CO5	PO1
41	Transmi	tter diversity		T1,7	Т2	1	В	В]	2	CO5	PO1,PO2
42	Receiver	r diversity- Channel state info	ormation	T1,	Т2	1	В	В	1	.2	CO5	PO1,PO2,PO3,PO4,,PO6
43	Capacity	y of flat fading channels		T1,	Т2	1	В	В	1	2	CO5	PO1,PO2,PO4,PO5
44		y of non-fading channels		T1,	Т2	1	В	В	1	.2	CO5	PO1,PO2,PO6
45		ison of beam forming, received and transmitter diversity	er	T2,R2	2,R3	1	В	В	1	.4	CO5	PO1,PO2,PO3,PO12
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Un	it 4	MULTIPATH MITIGATION TECHNIQUES					7	1	1	0	0	8	1	9
Un	it 5	MUTLIPLE ANTENNA TECHNIQUES					6	0	1	0	0	8	1	9
	Total					5	31	6	3	0	0	42	3	45
	Total Percentage					11.1111	68.8889	13.3333	6.66667	0	0	93.3333	6.66667	100
							CO PO Mapping							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	1	1	0	0	0	0	0	1	1	0
CO2	3	2	2	1	1	1	0	0	0	0	0	1	1	0
CO3	3	2	2	1	1	1	0	0	0	0	0	1	1	0
CO4	3	2	2	1	1	1	0	0	0	0	0	1	1	0
CO5	3	2	2	1	1	1	0	0	0	0	0	1	1	0
Avg	3	2	2	1	1	1	0	0	0	0	0	1	1	0
CO1					owledge of W	ireless cha		3) Gradua	tes will abl		e the prob	lems in the	e field of A	.M systems,PO12(1),Graduates
CO2	PO1(3) G	raduates w	vill be able	to underst	and the basic k	nowledge	of cellular	systems,P0	O2(2) Grad	luates will	able to cor	npare the o	lifferent m	ultiple access teheniques
СОЗ	OFDMP	O4(1) Grad		be able to	discuss about									the contextual knowledge abot cent tools in these signalling
CO4	PO2(2) Graduates will be able investigate at research level about equalization in wireless communication systems.PO4(1) Graduates will be able to understand the error probability of fading channels.													
CO5	PO2(2) Graduates will be able analyse the diversity schems in wireless communication systems. PO3(2) Graduates will able to compare the capacity of fading and non fading channels.													
•	3 High level 2					Moderate level					1	Low level		
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