

GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

LESSON PLAN

Name of the Subject: WIRELESS COMMUNICATION

Name of the Faculty: Nibedita Patra

Semester: 5th Semester

Branch: ETC

Semester From: July to December

No. of Weeks: 15 Weeks

Week	Day	Theory/ Practical Topics	Classes
		UNIT 1- Wireless Channel Fundamentals	5
1	1.	Wireless channel characteristics	1
	2.	Path loss and shadowing models	1
	3.	Time-varying channel impulse response	1
	4.	Narrowband vs. wideband fading channels	1
2	5.	Introduction to statistical fading models	1
		UNIT 2- Fading Models and Digital Modulation Performance	8
	6.	Detailed fading models: Rayleigh	2
	7.		
8.	Rician, Flat and frequency-selective fading	2	
3	9.		
	10.	Performance of digital modulation schemes (e.g., BPSK, QAM) over fading channels	2
	11.		
	12.	Link-level performance evaluation in wireless channels	2
4	13.		
		UNIT 3- Diversity Techniques and Performance Analysis	6
	14.	Time, frequency, and space diversity	1
	15.	receive diversity techniques	1
5	16.	Selective Combining (SC)	1
	17.	Maximal Ratio Combining (MRC), Equal Gain Combining (EGC)	1
	18.	Transmit diversity (e.g., Alamouti scheme)	1
	19.	Performance analysis in Rayleigh fading channels.	1
		UNIT 4- Multiple Access and Cellular Network Fundamentals	4
6	20.	Multiple Access Techniques: TDMA, FDMA, CDMA, OFDMA,	1
	21.	Cellular network concepts: Frequency reuse, spatial reuse	1
	22.	, Co-channel interference, Spectral efficiency and Grade of Service (GoS)	1
	23.	Capacity improvement: Cell splitting and sectorization.	1

		UNIT 5-Channel Capacity and Evolution of cellular Standards	7
7	24.	Channel capacity: AWGN, Flat and frequency-selective fading	1
	25.	Multi-user capacity and opportunistic communication,	1
	26.	Uplink (MAC) and downlink (broadcast) channel capacity	1
	27.	Overview of cellular standards: LTE and LTE-Advanced	1
8	28.	5G-NR architecture and features: slicing, beamforming	1
	29.	Understand the significance of the mmWave spectrum in 5G and beyond	1
	30.	Explain the principle of Massive MIMO and spatial multiplexing	1
	31.		1

Books Recommended:

1. Andrea Goldsmith, "Wireless Communications", Cambridge University press, 2006.
2. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication", Cambridge University Press, South Asian Edition, 2006
3. T.S. Rappaport, "Wireless Communication, Principles and Practice", PHI, 2002.
4. Simon Haykin and Michael Moher, "Modern Wireless Communications", Pearson Education, 2007