



SILVER OAK UNIVERSITY

College of Technology

Master of Technology

Electronics and Communication

Course Name: Wireless and Mobile Communication

Course Code: 1010097143

Semester: 2nd

Prerequisite:

Higher Engineering Mathematics, Fundamental knowledge of Signals and Systems Antenna and Wave Propagation and Digital Communication theory

Course Objective:

1. The purpose of this course is to provide an understanding of modern digital mobile and wireless communication systems.
2. Topics include: overview of cellular concept; interference and traffic analysis for cellular networks; wireless fading channel modeling and characterization; modulation and detection performance over fading channels; multi-carrier systems; receiver and transmitter diversity techniques

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
3	0	2	5	4

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1	Overview of wireless communication, cellular communication, different generations and standards in cellular communication system, satellite communication including GPS, wireless local loop, cordless phone, paging systems, RFID.	8	15
2	Recent Wireless Technologies: multicarrier modulation, OFDM, MIMO system, diversity multiplexing trade-off, MIMO OFDM system, smart-antenna; beam forming and MIMO, cognitive radio, software defined radio, communication relays, spectrum sharing	7	10
3	Multiple Access Techniques in Wireless Communication: contention-free multiple access schemes (FDMA TDMA, CDMA, SDMA and Hybrid), contention-based multiple access schemes (ALOHA and CSMA).	8	25

4	Wireless Networks: Wireless personal area networks (Bluetooth, UWB, and ZigBee), wireless local area networks (IEEE 802.11, network architecture, medium access methods, WLAN standards), and wireless metropolitan area networks (WiMAX).	8	25
5	Ad-hoc wireless networks: Design Challenges in Ad-hoc wireless networks, the concept of cross-layer design, security in wireless networks, energy-constrained networks. MANET and WSN. Wireless system protocols: mobile network layer protocol (mobile IP, IPv6, dynamic host configuration protocol), mobile transport layer protocol (traditional TCP, classical TCP improvements), support for mobility (wireless application protocol).	10	25

Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	Demonstrate their understanding on functioning of wireless communication system and evolution of different wireless communication systems and standards.	1
CO-2	Compare different technologies used for wireless communication systems	2
CO-3	Explain the architecture, functioning, protocols, capabilities and application of various wireless communication networks.	3
CO-4	Demonstrate an ability explain multiple access techniques for Wireless Communication	4
CO-5	Demonstrate an ability to evaluate design challenges, constraints and security issues associated with Ad-hoc wireless networks.	5

Teaching & Learning Methodology: -

1. Direct Instruction
2. Flipped Classrooms
3. Kinesthetic Learning
4. Context-Based Learning
5. Adaptive Teaching

List of Experiments/Tutorials:

Total Hours: 28

Sr. No.	Practical Name
1	To study different mobile communication standards and measure BW of each standard.

2	To study and perform channelization scheme and measure adjacent and co-channel interference in cellular system.
3	To study different diversity schemes and measure RF signal strength
4	To study and measure path loss exponent for different environment.
5	To study and perform GSM AT commands
6	To study Trunking theory and generate ERLANG table.
7	To study and generate PN sequence using matlab
8	To study the phase linearity of GMSK
9	Configuration and performance evaluation of IEEE 802.11 (Wi-Fi) networks using simulation tools.
10	Practical exercises on digital modulation techniques including QPSK, 16-QAM, and OFDM

Major Equipment:

Matlab, NS-2

Books Recommended: -

1. Vijay K Garg, “Wireless Communications and Networks”, Morgan Kaufmann Publishers an Imprint of Elsevier, USA 2009 (Indian reprint)
2. J. Schiller, “Mobile Communication” 2/e, Pearson Education, 2012.
3. ItiSahaMisra, “Wireless Communication and Networks : 3G and Beyond”, 2/e, McGraw Hill Education (india) Private Ltd, New Delhi, 2013.
4. Wireless Communications ,Andrea Goldsmith Cambridge University Press, 2007
5. Mobile Cellular Telecommunications (Analog and Digital Systems), 2nd Edition, By William C.Y. Lee-McGraw Hill
6. David Tse and Pramod Viswanath Fundamentals of Wireless Communication ,Cambridge University Press 2005

List of Open Source Software/learning website:

www.nptel.org, ocw.mit.edu (MIT Open-Course Ware)

CO-PO Matrix:

CO No.	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P O 7	P O 8	P O 9	P O 10	P O 11	PO 12	PSO1	PSO 2
CO-1	3	3	-	-	-	-	-	-	-	-	-	-	3	-
CO-2	3	3	-	-	3	-	-	-	-	-	-	-	3	-
CO-3		3	3	-	-	3	-	3	-	-	-	-	3	-
CO-4	3	3	3	3	-	-	-	-	-	-	-	-	3	-
CO-5		3	-	-	3	-	-	-	-	3	-	-	3	-