

Subject Code: 2ET4070501	Subject Title: WIRELESS NETWORK AND MOBILE COMMUNICATION
Pre-requisite	Fundamentals of Computer Networks

Course Objective:

The objectives of this course is to introduce the concepts of wireless and mobile communication and to make the students learn various wireless techniques, methods, architecture and protocols used in the mobile communication. Students will be exposed to various wireless network systems and standards. The course shall assist the students in identifying future research directions in the domain of mobile/wireless computing.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	-	2	4	60	40	20	30	150

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	Wireless Communications: - History and applications of wireless communications, - Characteristics of wireless channel: Pathloss, Fading, Interface, - Overview of Multiplexing: Frequency Division, Code Division and Time Division	06	14%
2	Wireless LAN: - Bluetooth :Architecture and Protocols, - Radio frequency identification(RFID),IEEE 802.11, - Wireless LAN security: WEP, WPA2 - Wireless Network: Introduction to adhoc network, - Types of Adhoc networks VNET, WSN, MANET etc. - issues and challenges, application of Adhoc network,	08	19%
3	Mobile Communication: - Global system for mobile communication (GSM): - GSMarchitecture, call routing in GSM, - PLMN interface, authentication and security, - Protocols, Mobile computing over SMS, CDMA, 3G and 4G Networks General packet radio service (GPRS): Main Features, GPRS Architecture: Roles of GGSN, SGSN, HLR, VLR, GPRS Mobile Station (MS). GPRS Protocols	10	24%
4	Mobile IP: - Introduction, Mobile IP: Goals, assumptions and requirements. - Entities and terminology. IP packet delivery. Agent Discovery. Registration. - Tunnelling andencapsulation. Optimizations. Reverse Tunnelling	08	19%
5	Mobile TCP: - Overview of Traditional TCP and implications of mobility control. - Improvement of TCP: Indirect TCP, Snoop TCP, Mobile TCP, Fast retransmit/fast recovery, - Time-out freezing, Selective retransmission, Transaction-oriented TCP.	10	24%

Course Outcome:

1. **CO1:** Explain the fundamental concepts and history of Wireless Communication, including path loss, fading, and multiplexing techniques (FDMA, CDMA, TDMA).
2. **CO2:** Analyze the architecture and protocols of Bluetooth, RFID, and IEEE 802.11 standards, and discuss Wireless LAN security mechanisms like WEP and WPA2.
3. **CO3:** Describe GSM and GPRS architecture, call routing, mobile computing over SMS, CDMA, and advancements in 3G and 4G Networks.
4. **CO4:** Understand Mobile IP concepts including goals, assumptions, IP packet delivery, agent discovery, tunneling, and optimizations for mobile communication.
5. **CO5:** Evaluate traditional TCP and its challenges in mobility, along with improvements like Indirect TCP, Snoop TCP, Mobile TCP, and strategies for fast retransmission and selective retransmission.

List of Experiments:

1. Discover and install the wireless simulator.
2. Study AODV protocol.
3. Study DSDV protocol.
4. Study DSR protocol.
5. Study & Compare performance of AODV and DSR with graphs.
6. Study & Compare performance of DSDV and DSR with graphs.
7. Identifies the devices in the wireless range (Neighbor Discovering).
8. Simulate a transmission of ping message over a network topology consisting of N nodes and find the number of packets dropped.
9. Study & Calculation of NRL, PDR, E2ED, Energy etc. using trace file.
10. Study the network traffic with fixed, variable length of packets,
11. Study the different mobility pattern models for network.

List of References:

1. Mobile Communication by Jochen Schiller (Pearson Education)
2. Mobile Computing, Asoke K Telukder, RooApa R Yavagal, TMH
3. Adhoc Wireless Networks by C. Siva Ram Murthy, Pearson Education
4. Handbook of Wireless Networks and Mobile Computing (WILEY-INDIA edition)

E-Resources / Web Links:

- [http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1530-8677](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1530-8677)
- <http://unina.stidue.net/Reti%20Wireless/Materiale/Handbook%20of%20Wireless%20Networks%20and%20Mobile%20Computing.pdf>

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes(POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	M	L	M	L	L						H	M		
CLO2	M	H	M	H	M	L	L						M	H		
CLO3	H	M	H	M	H	M	L						H	H		
CLO4	M	H	M	H	M	L	L						M	H		
CLO5	M	M	H	M	H	L	L						H	M		

H:High, M:Medium, L:Low