

WIRELESS LANS AND PANS

I Semester: ES								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BESB03	Elective	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 45		Tutorial Classes: Nil		Practical Classes: Nil			Total Classes: 45	

I. COURSE OVERVIEW:

This course intended to provide wireless network communication over short distances using radio or infrared signals instead of traditional network cabling. The basic knowledge of the wireless system, IEEE standards, network architecture, and its protocols. It focuses on data transmission among devices such as computers, smartphones, tablets, and personal digital assistant

II. COURSE OBJECTIVES:

The students will try to learn:

- I. The First and Second Generation Cellular Systems, Cellular Communications from 1G to3G, Wireless 4G systems.
- II. The importance of Wireless LANs, WLAN Topologies, Transmission Techniques: Wired Networks, Wireless Networks, comparison of wired and Wireless LANs; WLAN Technologies infrared technology, UHF narrowband technology, Spread Spectrum technology.
- III. The Network Architecture, Physical layer, The Medium Access Control Layer; MAC Layer issues: Hidden Terminal Problem and Reliability.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	Recall the generations of cellular systems for understanding the connectivity of wireless communication networks.	Understand
CO 2	Organize the random-access protocols to decrease collision and avoid crosstalk.	Apply
CO 3	Justify the importance of wireless LANs for connecting different devices through wireless communication to form an area network.	Evaluate
CO 4	Estimate the wireless PANs for interconnecting electronic devices within an individual person's workspace.	Evaluate
CO 5	Analyze the traffic engineering used to carry traffic flows that vary from those chosen automatically by the routing protocol.	Analyze
CO 6	Interpret the wireless networking standards and protocols for wireless transmission approved by IEEE.	Analyze

IV. SYLLABUS:

UNIT-I	WIRELESS SYSTEM & RANDOM ACCESS PROTOCOLS	Classes: 08
Introduction, First and Second Generation Cellular Systems, Cellular Communications from 1G to3G, Wireless 4G systems, The Wireless Spectrum; Random Access Methods: Pure ALOHA, Slotted ALOHA, Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access with Collision Detection (CSMA/CD), Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA).		

UNIT-II	WIRELESS LANS	Classes: 10
Introduction, importance of Wireless LANs, WLAN Topologies, Transmission Techniques: Wired Networks, Wireless Networks, comparison of wired and Wireless LANs; WLAN Technologies: Infrared technology, UHF narrowband technology, Spread Spectrum technology.		
UNIT-III	THE IEEE 802.11 STANDARD FOR WIRELESS LANS	Classes: 08
Network Architecture, Physical layer, The Medium Access Control Layer; MAC Layer issues: Hidden Terminal Problem, Reliability, Collision avoidance, Congestion avoidance, Congestion control, Security, The IEEE 802.11e MAC protocol.		
UNIT-IV	WIRELESS PANS	Classes: 10
Introduction, importance of Wireless PANs, The Bluetooth technology: history and applications, technical overview, the Bluetooth specifications, piconet synchronization and Bluetooth clocks, Master-Slave Switch; Bluetooth security; Enhancements to Bluetooth: Bluetooth interference issues, Intra and Inter Piconet scheduling, Bridge selection, Traffic Engineering, QoS and Dynamics Slot Assignment, Scatter net formation.		
UNIT-V	THE IEEE 802.15 WORKING GROUP FOR WPANS	Classes: 09
The IEEE 802.15.3, The IEEE 802.15.4, ZigBee Technology, ZigBee components and network topologies, The IEEE 802.15.4 LR-WPAN Device architecture: Physical Layer, Data Link Layer, The Network Layer, Applications; IEEE 802.15.3a Ultra wideband.		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. Ad Hoc and Sensor Networks - Carlos de Morais Cordeiro and Dharma Prakash Agrawal, World Scientific, 2011. 2. Wireless Communications and Networking - Vijay K.Garg, Morgan Kaufmann Publishers, 2009 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. Wireless Networks - Kaveh Pahlaram, Prashant Krishnamurthy, PHI, 2002. 2. Wireless Communication- Marks Ciampor, George Olenewa, Cengage Learning, 2007. 		