

WIRELESS LANS AND PANS

I Semester: ES								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BESB03	Core	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 45		Tutorial Classes: Nil		Practical Classes: Nil			Total Classes: 45	
<p>OBJECTIVES: The course should enable the students to:</p> <ol style="list-style-type: none"> Learn about First and Second Generation Cellular Systems, Cellular Communications from 1G to 3G, Wireless 4G systems. Understand about 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. Learn about Network Architecture, Physical layer, The Medium Access Control Layer; MAC Layer issues: Hidden Terminal Problem and Reliability. <p>COURSE OUTCOMES (COs):</p> <p>CO 1: Describe first and second generation cellular systems and analyze cellular communications from 1G to 3G.</p> <p>CO 2: Understand and analyze WLAN topologies and analyze transmission techniques.</p> <p>CO 3: Demonstrate network architecture and analyze MAC layer issues and describe the importance of MAC layer applications.</p> <p>CO 4: Explore Bluetooth technology and Bluetooth specifications, describe the importance of wireless private area networks.</p> <p>CO 5: Develop practical skills in the use of ZigBee components and network topologies.</p> <p>COURSE LEARNING OUTCOMES (CLOs):</p> <ol style="list-style-type: none"> Understand and Analyze First and Second Generation Cellular Systems with architectures. Analyze Cellular Communications from 1G to 3G with architectures of AMPs, GSM and GPRS. Explain Wireless 4G systems & Wireless Spectrum of 4G with increased bandwidth and speed. Distinguish Random Access Methods of Pure ALOHA and Slotted ALOHA. Describe Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access with Collision Detection (CSMA/CD), Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA). Describe importance of Wireless LANs with components such as BSS, stations, ESS, Distributed systems Explain WLAN Topologies of infrastructure and adhoc mode of operations. Analyze Transmission Techniques and Distinguish wired and wireless LANs. Explain Network Architecture of IEEE 802.11 standard for wireless lans and Analyze MAC Layer issues. 								

<p>10. Describe importance of Wireless PANs and explain Bluetooth technology with Specifications and Enhancements.</p> <p>11. Explain Bluetooth interference issues, Traffic Engineering, QoS and Dynamics Slot Assignment.</p> <p>12. Describe IEEE 802.15.3 architecture.</p> <p>13. Understand ZigBee technology, components and network topologies.</p> <p>14. IEEE 802.15.4 LR-WPAN Device architecture: Physical Layer, Data Link Layer, The Network Layer, Applications.</p>		
UNIT -I	WIRELESS SYSTEM&RANDOM ACCESS PROTOCOLS	Classes: 08
<p>Introduction, First and Second Generation Cellular Systems, Cellular Communications from 1G to 3G, 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).</p>		
UNIT – II	WIRELESS LANS	Classes: 10
<p>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.</p>		
UNIT – III	THE IEEE 802.11 STANDARD FOR WIRELESS LANS	Classes: 08
<p>Network Architecture, Physical layer, The Medium Access Control Layer; MAC Layer issues: Hidden Terminal Problem, Reliability, Collision avoidance.</p> <p>Congestion avoidance, Congestion control, Security, The IEEE 802.11e MAC protocol.</p>		
UNIT - IV	WIRELESS PANS	Classes: 10
<p>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.</p>		
UNIT -V	THE IEEE 802.15 WORKING GROUP FOR WPANS	Classes: 09
<p>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..</p>		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. Carlos de Moraes Cordeiro, Dharma Prakash Agrawal, “AdHoc and Sensor Networks”, World Scientific, 2011. 2. Vijay K.Garg, “Wireless Communications and Networking”, Morgan Kaufmann Publishers, 2009. 		

REFERENCES:

1. Kaveh Pahlaram, Prashant Krishnamurthy, "Wireless Networks", PHI, 2002.
2. Marks Ciampor, Jeorge Olenewa, "Wireless Communication", Cengage Learning, 2007.