Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
ETC801	Wireless Networks	4	--	--	4	--	--	4
		Examination Scheme						
		ISE		MSE		ESE		
		10		30		100 (60% Weightage)		

Pre-requisite Course Codes		ETC 603 Computer Communication and Networks ETC 702 Mobile Communication
After successful completion of the course, student will be able to		
Course Outcomes	CO1	Design the phases of planning and design of mobile wireless networks.
	CO2	List and compare personal area network (PAN) technologies such as Zig bee, Bluetooth.
	CO3	Understand details of sensor network architecture ,traffic related protocols, transmission technology etc.
	CO4	Understand middle ware protocol and network management issues of sensor networks.

Module No.	Unit No.	Topics	Ref.	Hrs.
1	**Overview of Cellular Systems**		1,3	08
	1.1	Mobile telephony, introduction to GSM.		
	1.2	Universal mobile telecommunication system		
	1.3	Introduction to HSPA, Advanced Antenna Systems for HSPA + and LTE		
2	**Planning and Design of Wide-Area Wireless Networks**		1,2,3	12
	2.1	Basics of indoor RF planning		
	2.2	Three phases of wireless network design		
	2.3	Indoor coverage from the macro layer		
	2.4	Link budgets for GSM, CDMA, CDMA2000, HSDPA systems, indoor UMTS/HSPA challenge, common UMTS rollout mistake		
3	**Emerging Wireless Technologies**		2,3,4	10
	3.1	**Bluetooth:** concepts of Pico net , scatter net etc., protocol stack, link types, security, network connection establishments, usage models, etc.		
	3.2	**ZigBee**: components, architecture, network topologies, protocol stack etc.		
	3.3	**UWB and RFID:** technical requirements, components and characteristics, applications		
	3.4	**WiMAX:** 802.16 based protocol architecture, physical layer, fixed and mobile WiMAX		

4	**Overview of Wireless Sensor Network**		3,4	12
	4.1	Background of sensor network technology, sensor network architectural elements, historical survey of sensor networks		
	4.2	Applications of wireless sensor network, range of applications, examples of category 1 and 2 WSN Applications		
	4.3	Technologies for wireless sensor network, sensor node technology, hardware and software, sensor taxonomy		
	4.4	Wireless network, operating environment, wireless network trends, transmission technology		
	4.5	Medium access control protocols, routing protocols, transport control protocols		
5	**Middleware for Sensor Networks & Network Management**		3,4,5	10
	5.1	Middleware principles		
	5.2	Middleware architecture, existing middleware		
	5.3	Network management, requirements		
	5.4	Network management models, design issues		
			Total	**52**

References:

1. Indoor Radio Planning: A Practical Guide for GSM, DCS, UMTS, HSPA and LTE, 2nd Edition Morten Tolstrup ISBN: 978-0-470-71070-8 480 - July 2011 -Wiley

2. Vijay K. Garg, ―*Wireless Communication and Networking*‖ , Morgan -Kaufmann Series in Networking—Elsevier

3. Kazem Sohraby, Daniel Minoli, and Taieb Znati, ―*Wireless Sensor Networks: Technology, Protocols, and Applications*‖ , Wiley Student Edition

4. Feng Zhao and Leonidas Guibas, ―*Wireless Sensor Networks, An Information Processin Approach*‖ ,--Morgan Kaufmann

5. Holger and Andreas Willig, ―*Protocols and Architectures for WSN*‖ , Wiley student edition