

Subject Code	Course Name	Teaching Scheme	Credits Assigned					
			Theory	Practical	Tutorial	Theory	TW/ Practical	Tutorial
ETC801	Wireless Networks	04	--	--	04		--	04

Course Code	Course Name	Examination Scheme								
		Theory Marks					Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam					
		Test 1	Test 2	Avg. of Test 1 and Test 2						
ETC801	Wireless Networks	20	20	20	80	--	--	--	100	

Course Pre requisites :

- ETC 603 Computer Communication and Networks
- ETC 702 Mobile Communication

Course Objectives:

- Introduction to planning and design of wireless networks
- Introduction to HSPA systems
- To study emerging technologies like Bluetooth, zigbee, Wimax
- Understanding the wireless sensor network architecture and the protocol stack and WSN applications.

Course Outcomes: The students will be able to:

- Describe the phases of planning and design of mobile wireless networks
- List and compare personal area network (PAN) technologies such as Zigbee, Bluetooth etc
- Students will details of sensor network architecture, traffic related protocols , transmission technology etc
- Understand middleware protocol and network management issues of sensor networks

Module No.		Topics	Hrs.
1		Overview of Cellular Systems	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	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	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	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	
6		Middleware for Sensor Networks & Network Management	10
	6.1	Middleware principles	
	6.2	Middleware architecture, existing middleware	
	6.3	Network management, requirements	
	6.4	Network management models, design issues	
Total			52

Recommended Books:

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

Internal Assessment (IA):

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the test will be considered as final IA marks

End Semester Examination:

1. Question paper will comprise of 6 questions, each of 20 marks.
2. Total 4 questions need to be solved.
3. Question No.1 will be compulsory and based on entire syllabus wherein sub questions of 2 to 5 marks will be asked.
4. Remaining questions will be selected from all the modules