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
ETC702	Mobile communication	4	--	--	4	--	--	4
		Examination Scheme						
		ISE		MSE		ESE		
		10		30		100 (60% Weightage)		

Pre-requisite Course Codes		ETC 601 Digital Communication ETC 603 Computer Communication and Networks
After successful completion of the course, student will be able to		
Course Outcomes	CO1	Understand GSM, CDMA concepts and architecture frame structure, system capacity, service provided.
	CO2	Study of evolution of mobile communication generations 2G,2.5 G,3G with their characteristics and limitations.
	CO3	Understand Emerging Technology required for fourth generation mobile systems such as SDR, MIMO etc.
	CO4	Understand different indoor and outdoor propagation models related to losses and different type of fading.

Module No.	Unit No.	Topics	Ref.	Hrs.
1	**Fundamentals of Mobile Communication**		1,3	10
	1.1	Introduction to wire1ess communication		
	1.2	Frequency Division Multiple access, Time Division Multiple access, Spread Spectrum Multiple access, Space Division Multiple access, and OFDM		
	1.3	Frequency reuse, channel assignment strategies, handoff strategies, interference and system capacity, trunking and grade of service, improving the capacity of cellular systems. and related design problems		
2	**2G Technologies**		1,3,	13
	2.1	GSM Network architecture, signaling protocol architecture, identifiers, channels, introduction frame structure, speech coder RPE-LTP, authentication and security, call procedure, handoff procedure, services and features		
	2.2	**GSM evolution in GPRS and EDGE:** Architecture and services offered		
	2.3	**IS-95 A& B(CDMA-1):** Frequency and channel specifications of forward and reverse CDMA channel, packet and frame formats, mobility and radio resource management		
3	**3G Technology**		1,2,3	09
	3.1	**IMT-2000/UMTS:** Network architecture, air Interface		

		specification, forward and reverse channels in W-CDMA and CDMA 2000, spreading and modulation.		
	3.2	Cell search and synchronization, establishing a connection, hand off and power control in 3G system		
4	**3GPP LTE**		1,4	08
	4.1	Introduction and system overview		
	4.2	Frequency bands and spectrum ,network structure, and protocol structure		
	4.3	Frame slots and symbols, modulation, coding, multiple antenna techniques		
	4.4	**Logical and Physical Channels:** Mapping of data on to logical sub-channels physical layer procedures, establishing a connection, retransmission and reliability, power control.		
5	**Emerging Technologies for 4G**		4	06
	5.1	4G Introduction and vision		
	5.2	Multi antenna Technologies: MIMO; software defined radio		
	5.3	Adaptive multiple antenna techniques, radio resource management, QOS requirements		
	5.4	Overview of 4G research initiatives and developments		
6	**Mobile Radio Propagation**		5,6	06
	6.1	Study of indoor and outdoor propagation models		
	6.2	Small scale fading and multi-path Small-scale multi-path propagation, parameter of multi-path channels, types of small scale fading, Raleigh and Ricean distribution,		
			Total	**52**

References:

1. Theodore S. Rappaport , ―*Wireless Communications*‖ , Prentice Hall of India, PTR publication

2. Andreas Molisch , ―*Wireless Communications*‖ , Wiley, Student second Edition.

3. Vijay Garg , ―*Wireless Network Evolution 2G-3G*‖ , Pearson Education.

4. Young Kyun Kim and Ramjee Prasad, ―*4 G Roadmap and Emerging Communication Technologies* ―, Artech house.:

5. Raj Pandya , ―*Mobile And Personal Communications Systems And Services*‖ , Prentice hall.

6. Singhal , ―*Wireless Communication*‖ , TMH

7. C.Y Lee , ―Mobile Communication‖ , Wiley