

22ECPE803	TELECOMMUNICATION AND SWITCHING NETWORKS	SEMESTER VIII			
PRE-REQUISITE		CATEGORY	PE	Credit	3
1. Digital communication		Hours/Week	L	T	P
			3	0	0
Course Objectives:					
1.	<u>To understand the fundamentals and application of telecommunication networks.</u>				
2.	<u>To understand and design Modern digital telecommunication switching and networks.</u>				
3.	<u>To understand recent topics like switching systems, time division switching systems, ISDN, voice data integration and importance of telephone traffic analysis and telephone networks.</u>				
Unit I	MULTIPLEXING	9	0	0	9
Transmission Systems, FDM Multiplexing and modulation, The Introduction to digits, Digital Transmission and Multiplexing: Pulse Transmission, Asynchronous and synchronous transmission, Line Coding, Binary N-Zero Substitution, Digital Biphasic, Differential Encoding, error performance Time Division Multiplexing, Time Division Multiplex Loops and Rings.					
Unit II	DIGITAL SWITCHING	9	0	0	9
Switching Functions, Space Division Switching, Time Division Switching, two-dimensional Switching: STS Switching, TST Switching, No.4 ESS Toll Switch, Digital Cross-Connect Systems, Digital Switching in an Analog Environment. Elements of SSN07 signalling.					
Unit III	NETWORK SYNCHRONIZATION CONTROL AND MANAGEMENT	9	0	0	9
Timing: Timing Recovery, Phase-Locked Loop, Clock Instability, Elastic Store, Jitter Measurements, Systematic Jitter. Timing Inaccuracies: Slips, Asynchronous Multiplexing, Network Synchronization, U.S. Network Synchronization, Network Control, Network Management.					
Unit IV	DIGITAL SUBSCRIBER ACCESS	9	0	0	9
ISDN: Basic Rate Access Architecture, ISDN U Interface, ISDN D Channel Protocol. High-Data-Rate Digital Subscriber Loops: Asymmetric Digital Subscriber Line, VDSL, Digital Loop Carrier Systems: Universal Digital Loop Carrier Systems, Integrated Digital Loop Carrier Systems, Next-Generation Digital Loop Carrier, Fiber in the Loop, Hybrid Fiber Coax Systems, and Voice band Modems: PCM Modems, Local Microwave Distribution Service, Digital Satellite Services.					
Unit V	TRAFFIC ANALYSIS	9	0	0	9
Traffic Characterization: Arrival Distributions, Holding Time Distributions, Loss Systems, Network Blocking Probabilities: End-to-End Blocking Probabilities, Overflow Traffic, Delay Systems: Exponential service Times, Constant Service Times, Finite Queues.					
Total (45L) = 45 Periods					

Text Books:	
1.	J. Bellamy, "Digital Telephony", John Wiley, 2003, 3rd Edition.
2.	JE Flood, "Telecommunications Switching, Traffic and Networks", Pearson.
Reference Books:	
1.	R.A.Thomson, "Telephone switching Systems", Artech House Publishers, 2000.
2.	W. Stalling, "Data and Computer Communications", Prentice Hall, 1993.
3.	T.N.Saadawi, M.H.Ammar, A.E.Hakeem, "Fundamentals of Telecommunication Networks", Wiley Inter science, 1994.
4.	Syed. R. Ali —Digital switching systemsl, McGraw Hill New York 1998
E-References:	
1.	https://www.telecommunications-tutorials.com/
2.	https://cosmolearning.org/video-lectures/sonetsdh-11113/
3.	https://ieeexplore.ieee.org/document/6770122

Course Outcomes: Upon completion of this course, the students will be able to		Bloom's Taxonomy Mapped
CO1	Understand the concepts of Frequency and Time division multiplexing	L2
CO2	Design the Space division switching and Time division switching	L3
CO3	Understand the concepts of network organization of telephone networks	L2
CO4	To compare telephone network, data network and integrated service digital network.	L2
CO5	Analyze traffic in telephone networks	L3

COURSE ARTICULATION MATRIX

COs/POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
CO1	2													2	1
CO2	2	1											2	2	1
CO3	2		1			1							2	2	1
CO4	2		1											2	1
CO5	2	1		1									2	2	1
Avg	2	0.4	0.4	0.2		0.2							1.2	2	1
3/2/1 - indicates strength of correlation (3-High,2- Medium,1- Low)															