

1.	Course Title	Data Communication & Telecommunication Systems		
2.	Course Code	CNET2513		
3.	Status	Faculty		
4.	Credit Hour	3 (2+1) 2 lecture (2 hours lecture x 14 weeks) 1 tutorials (1.5 hours per x 14 weeks) using simulator & emulator supervised by tutor		
5.	Semester/Year	2/2		
6.	Prerequisites	N/A		
7.	Teaching method:	Distance Learning (Electronic)		
8.	Evaluation	Assessment and Marking Percentage: Participation5% Quizzes15% Project15% Mid Sem Exam15% Final Examination50%		
9.	Lecturer			
10.	Objective of the Subject	The main objectives of the course are as follows: - To provide students with concepts of data communications and telecommunication systems. - To understand the fundamentals of Communication Architecture, Protocols and Local Area Networks. - To expose the various types of network in terms of the technologies, hardware, and usage.		
11.	Learning Outcomes	By the end of the subject, students should be able to: - demonstrate understanding about various data communication transmission media, Interface and modulation techniques. - understand the link layer data transmission techniques and protocols. - explain the basic building blocks of a Local Area Network.		
12.	Synopsis	The course will expose the students to the overall understanding and knowledge in basic data communication and telecommunication systems. The major area of studies include physical interface, transmission medium, data integrity and security, data compression, improving data communication efficiency, data encoding and modulation, architecture and protocol, LAN, internetworking and digital switching system.		
13.	Topics	Details	Lecture (Hrs)	Tutorial (Hrs)
	Week 1	Introduction Data Communications. Data Communication Networking. Protocols and Protocol Architecture (TCP/IP and OSI). Compare TCP/IP architecture and OSI model. Standards Organizations.	2	1.5
	Week 2	Data Transmission Transmission Terminology. Frequency, Spectrum and Bandwidth. Transmission Impairments. Nyquist’s and Shannon’s Law.	2	1.5
	Week 3	Transmission Media Guided and Unguided. Twisted pair. Coaxial cable. Fibre optic. Microwave. Cellular. Satellite.	2	1.5

Bachelor of Information Technology (Hons)

	Week 4	Data Encoding and Modulation Digital to Digital: NRZ-L, NRZ-I, Bipolar-AMI, Pseudoternary, Manchester, Differential Manchester. Modulation Rate. Digital to Analog: Amplitude Shift keying (ASK), Frequency Shift keying (ASK), Phase Shift keying (PSK). Analog to Digital: PCM. Analog to Analog: Amplitude Modulation, Frequency Modulation, Phase Modulation.	2	1.5
	Week 5	Data Communication Interface Synchronous and Asynchronous Transmission. Line Configurations: Simplex, Half-duplex, Full duplex. EIA-232 Interface Standard. DTE and DCE. Null Modem.	2	1.5
	Week 6	Data Link Control Flow Control: Stop-and Wait, Sliding Window. Error Detection: Parity Check, CRC Methods. HDLC: Characteristics, Frame Structure, and Operation. Data Compression: Huffman Coding and Dynamic Huffman Coding.	2	1.5
	Week 7	Multiplexing Frequency Division Multiplexing: Characteristics. Synchronous Time Division.	2	1.5
	Week 8	Multiplexing: Characteristics, Link Control, Digital Carrier Systems, Statistical Time Division Multiplexing: Characteristics. ADSL and HDSL Line	2	1.5
	Week 9	Circuit Switching and Packet Switching Introduction: Switching Networks, Circuit Switching Networks, Circuit Switching Concepts. Routing in Circuit Switching Networks.	2	1.5
	Week 10	Introduction to Control Signalling: SS7. Packet Switching: Technique, Packet Size, Compare Circuit Switching and Packet Switching. Routing: Characteristics, Routing Strategies: Fixed Routing, Flooding, Random Routing, Adaptive Routing	2	1.5
	Week 11	LAN Technology LAN Applications. LAN Architecture: Protocol Architecture, Topologies, MAC, LLC. Bus LAN: Characteristics, Media, Use of Repeater in extension of BUS. Ring LAN: Characteristics	2	1.5
	Week 12	Star LAN: Characteristics, Use of Hubs and Switches. Wireless LAN: Applications, Requirements, and Technology. Bridge: Function of a Bridge, Protocol Architecture.	2	1.5
	Week 13	LAN Systems Ethernet (CSMA/CD): IEEE 802.3 MAC, IEEE 802.3 10 Mbps Specifications (10Base5, 10Base2, 10Base-T, 10Base-F). IEEE 802.3 100 Mbps Specifications: Introduction to Fast Ethernet and Gigabit Ethernet. Token ring	2	1.5
	Week 14	IEEE 802.5 MAC, Physical Layer specifications. FDDI: MAC, Physical Layer specifications. Wireless LAN Standard: IEEE 802.11 Physical Layer Specifications and MAC.	2	1.5
		Total contact hours	28	21
		Equivalent lecture hours	28	14
		Total lecture hours	42	
		Credit hours	3	
14.	Main reference: Textbook:	Chris Reed and John Angel, Computer Law: The Law and Regulation of Information Technology (2007)		
15.	Additional References:	1. William J Beyda, Data Communications: From Basics to Broadband (4th Edition) by (2004)		

Bachelor of Information Technology (Hons)

		2. Behrouz A. Forouzan, Data Communications Networking (2006) 3. Behrouz A. Forouzan, Data Communications and Networking (McGraw-Hill Forouzan Networking) (2007) 4. William A. Shay, Understanding Data Communications and Networks, Third Edition (2003)
	Other Materials:	All materials will be available to the students online.