

1	Title of Subject	<b>Data Communications and Telecommunication Systems</b>		
2	Subject Code	DCT5028		
3	Status of Subject	Major		
4	Stage	Diploma		
5	Version	Date of Previous Version: January 2005 Date of Current Version: May 2008		
6	Credit Hours	4		
	LAN Credit Hours Equivalent	4 (3+1) Lectures = 42 (3 hours per week x 14 weeks) Tutorials = 21 (1.5 hours per week x 14 weeks)		
7	Pre-Requisite	None		
8	Teaching Staff	Usha Sundramraji		
9	Semester	Trimester 3		
10	Aim of Subject	To provide a basic understanding of communications.		
11	Learning Outcomes of Subject	<p>Upon completion of the subject, students should be able to :</p> <ul style="list-style-type: none"> <li>Analyze the communication and transmission model</li> <li>Explain the various transmission media.</li> <li>Describe the OSI 7 Layers</li> <li>Identify the various LAN Topologies</li> <li>Differentiate circuit switching to packet switching.</li> </ul>		
12	Assessment Scheme	Coursework	Midterm Test Quizzes Tutorials /Assignments	30% 10% 10%
		Final Exam	Written Exam	50%
13	Details of Subject	Topics		Contact Hours
				Lectures      Tutorials
		<b>Topic 1 : Introduction to Communications</b> Communication model. Simplex, half duplex, full duplex, parallel transmission, serial transmission, synchronous transmission, asynchronous transmission. Compression methods - character suppression, Huffman coding, dynamic Huffman.		5              2

		<b>Topic 2 : Data Transmission and Transmission Media</b> Transmission terminology: Frequency, Spectrum, and Bandwidth. Guided transmission – twisted pair, coaxial cable, fiber optics. Unguided transmission – infrared, radio, microwave, satellite.	4	2
		<b>Topic 3 : Protocols</b> Introduction to protocol, protocol architecture, standard organizations – ITU-T, ISO, IEEE, EIA, ANSI. The seven layers of OSI Model. TCP/IP Protocol Architecture. Data Link Control – Error Control and Flow Control – stop and wait, sliding window. HDLC: Characteristics, frame structure and operation.	6	3
		<b>Topic 4: Data Encoding and Modulation</b> Digital to Digital: NRZ-L, NRZ-I, Bipolar-AMI, Pseudoternary, Manchester, Differential Manchester, Modulation Rate. Digital to Analog: Amplitude Shift Keying (ASK), Phase Shift Keying (PSK). Analog to Digital: PCM. Analog to Analog: Amplitude Modulation, Frequency Modulation, Phase Modulation.	6	3
		<b>Topic 5: Multiplexing</b> Frequency Division Multiplexing: Characteristics. Synchronous Time Division Multiplexing: Characteristics and Statistical Time Division Multiplexing.	5	2
		<b>Topic 6: Local Area Network Technology</b> LAN characteristics, topology – ring, star, bus, tree, mesh and hybrid. LAN protocol architecture: MAC, LLC. Medium access control – round robin, reservation and contention. Network devices – bridge, router, gateway.	5	3
		<b>Topic 7: LAN System</b> Ethernet (CSMA/CD): IEEE 802.3 MAC, IEEE 802.3 10Mbps Specification (10Base5, 10Base2, 10Base-T, 10Base-F). Introduction to Fast Ethernet and Giga Ethernet. Token Ring, Token Bus, FDDI, Wireless LAN	5	3
		<b>Topic 8 : Circuit Switching and Packet Switching</b> Introduction: Switching network, circuit switching networks, circuit switching concept. Packet switching principles compare circuit switching and packet switching, routing in packet switching network: fixed routing, flooding, random routing, adaptive routing.	6	3
		Total Contact Hours	42	21
		Equivalent to LAN Credit Hours	3	1
		Total Credit Hours	4	
14	Teaching and Learning Activities	This subject will be delivered using the following means: <ul style="list-style-type: none"> <li>Lecture Hours = 42 hours</li> <li>Tutorial Hours = 21 hours</li> </ul>		

		<ul style="list-style-type: none"> <li>Total Contact Hours = 63 hours</li> </ul>	
15	Laboratory	Basic windows command (ping, tracert, ipconfig, etc), identify type of network cables (UTP, fiber optic, coaxial cable), use simulator to simulate packet flowing in the network.	
16	Text & References	Text	1. William Stallings, <i>Data &amp; Computer Communications</i> , 8th. Edition, Prentice Hall, 2007
		References	<ol style="list-style-type: none"> <li>Behrouz A. Forouzan, <i>Data Communications and Networking</i>, 3rd Edition, McGrawHill, 2003.</li> <li>M. Duck, R. Reed, <i>Data Communications and Computer Networks</i>, 2<sup>nd</sup> Edition, Prentice Hall, 2003</li> <li>Fred Halsall, <i>Data Communications, Computer Networks &amp; Open System</i>, 4th. Edition, Addison-Wesley, 1996.</li> <li>A S Tanenbaum, <i>Computer Networks</i>, 3<sup>rd</sup> Edition, Prentice Hall, 1996.</li> </ol>