GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code:3143201
Semester – IV
Subject Name: Data Communication & Computer Networks

Type of course: Undergraduate

Prerequisite: Basics of analog and digital communication and computer hardware and software

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	2	5	70	30	30	20	150

Syllabus:

Sr. No.	Content	Total Hrs	% Weightage
1	**Introduction:** Data communications, networking & the Internet, Data Transmission - transmission techniques, Topologies & Transmission Media, switched networks- circuit & packet switching. Digitization. OSI model, TCP/IP protocol architecture.	6	11
2	**Signals, Analog and Digital transmission:** Analog signal, Digital Signal, Analog vs Digital, Data rate, Transmission impairments, Propagation delay, sampling, serial transmission, parallel transmission, ASK, FSK, PSK, QAM, modems	6	11
3	**Data Link Layer Protocols:** Data link layer fundamentals-error detection, error correction. Flow control- Stop & wait, Sliding Window Protocols. Error Control - Go-Back-N ARQ, Selective Reject ARQ .High level Data Link Control (HDLC)	8	14
4	**Network Layer & Transport Layer Protocols:** Routing protocols-Distance vector routing, Link state routing, Path vector Routing. Internet protocols-ICMP, IPv4& IPv6, Connection Oriented & Connectionless services-UDP, TCP	14	25
5	**LAN & MAN Protocols:** Channel Allocation, Multiple Access, LAN protocols - Ethernet, CSMA/CD, Token bus, Token ring, FDDI. MAN Protocols- IEEE 802.6(DQDB), SMDS, Frame Relay & ATM.	8	14
6	**Application Layer Protocols:** Internet Applications, Electronic Mail (SMTP, MIME) & Management, FTP, CMIP, SNMP, HTTP.	6	14
7	**Network Security:** Cryptography, Symmetric key Algorithms (DES, AES), Public key Algorithms-RSA, Digital Signatures, IPSec ,Firewall	6	11

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Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

After learning the course the students will be able to

Sr. No.	CO statements	Marks %Weightage
CO-1	Understand the architecture of various networking technologies	
CO-2	Analyze the requirements of the organization and able to select the appropriate topology and structure of networks.	
CO-3	Have operational knowledge of managing the networks of organization.	
CO-4	Design the network for organization with better network efficiency parameters	

References:

1. Data Communication & Networking: By Behrouz A. Forouzan. Tata McGraw Hill.
2. Data & Computer Communications: By William Stallings. Prentice Hall India.
3. Communication Networks: Fundamental concepts and Key architectures: By Alberto Leon-Garcia and Indra Widjaja, McGraw Hill
4. Computer Networks: By Andrew S. Tanenbaum. Prentice Hall India.