GUJARAT UNIVERSITY

K. S. SCHOOL OF BUSINESS MANAGEMENT

M.Sc. IN COMPUTER APPLICATIONS AND INFORMATION TECHNOLOGY

[Five Years' (Full-time) Integrated Degree Course]

Sixth Semester M.Sc. (CA & IT)

KS_C_CC -363 Data Communication and Networking

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3 credit course

Objective:

To introduce the basics of Computer Networks, Understand the functionality of each layer of OSI and TCP/IP models and interactions between them, To gain basic insight of programming for network solutions.

UNIT I: **(20%)**

- **Introduction :-** Uses of Computer Networks, Network Hardware, Network Software, Reference Models
- **The Physical Layer :-** The Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Communication Satellites, Public Switched Telephone Network, Mobile Telephone System, Cable Television

UNIT II: **(20%)**

- **The Data Link Layer :-** Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols

UNIT III: **(20%)**

- **The Medium Access Control Sub Layer :-** The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANS, Broadband Wireless, Data Link Layer Switching

UNIT IV: **(20%)**

- **The Network Layer : -** Design Issues - Store and forward packet switching, Service provided to transport layer, Implementation of connection oriented and connection less service, Comparison of virtual circuit and datagram subnets, Routing algorithms – The Optimality principle, Shortest path routing, Flooding, Distance vector routing, Link state routing, Hierarchical routing, Broadcast routing, Multicast routing. Congestion control algorithms principles, Prevention policies, Congestion control in virtual circuit subnets, Congestion control in datagram subnets, Load shedding, Jitter control. Quality of service - Requirements, techniques for achieving good quality of service, the network layer in the internet - The IP protocol, IP addresses.

UNIT V: **(20%)**

- **The Transport Layer :**- The transport service - Services provided to the upper layers, Transport service primitives, Elements of transport protocol - addressing, Connection establishment, Connection release, Flow control, Multiplexing, Crash recovery.
- **The Application layer: -** Electronic mail - overview. World Wide Web: Architectural overview, HTTP - overview.

Recommended Lecture Scheme: Approximately 45 hours of classroom teaching

Recommended Practical Scheme: Not Applicable

Assignment: One assignment every month.

Text Books:

1. Computer Networking
   By Andrew S. Tanenbaum, Prentice Hall, Fourth Edition
2. Computer Networks
   By Bhushan H Trivedi, Oxford Univercity Press

Reference Books:

1. Data Communications and Networking
   By Behrouz A. Forouzan, Tata McGraw-Hill, Fourth Edition