

GUJARAT TECHNOLOGICAL UNIVERSITY

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: IV

Subject Name: **Fundamentals of Networking (FON)**

Subject Code: **640001**

Learning Objectives:

- To introduce the basics of Computer Networks
- To 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

Prerequisites:

C Programming, Basic knowledge of Linux OS, Java Programming (Core Java)

Contents:

1. Introduction [8%]

Uses of Computer Networks, Network Hardware, Network Software, Reference Models

2. The Physical Layer [17%]

The Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Communication Satellites, Public Switched Telephone Network, Mobile Telephone System, Cable Television

3. The Data Link Layer [10%]

Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols

4. The Medium Access Control Sub Layer [20%]

The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANS, Broadband Wireless, Data Link Layer Switching

5. The Network Layer [15%]

Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms

6. The Transport Layer [10%]

The Transport service, Elements of Transport Protocols

7. The Application Layer [5%]

Domain Name System, Electronic Mail

8. Network Security [15%]

Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures

Text Book (Theory):

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

Other Reference Book (Theory):

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

Chapter Wise Coverage from Text Book:

Content no.	Topics / Subtopics from Book No 1	No of Lectures
8.	8.1, 8.2, 8.3.1, 8.4.1,8.4.2, 8.4.3	7
Content no.	Topics / Subtopics from Book No 2	No. of Lectures
1	1.1,1.2.1,1.2.4,1.2.5,1.2.6,1.2.7,1.2.8, 2.9.1,2.9.2	3
2	3.1 to 3.4, 3.5 to 3.7, 4.2.6 to 4.2.8, 4.3,4.4, 4.6.1 to 4.6.4, 4.6.6, 4.7.1,4.7.2,4.7.5 to 4.7.10	12
3	5.1.2 to 5.2.6, 5.2.8,5.2.9, 5.2.11, 5.3	6
4	6.1 to 6.6,	9
5.	7.7.1, 7.7.3, 7.7.4, 7.11	5
6.	8.1 to 8.3	3
7.	9.2,1 to 9.2.5, 9.4.1 to 9.4.6, 9.4.10, 9.4.11	3
	Total No of Lectures	48

* Students are not required to reproduce the entire algorithms/protocol code in the theory exam for data link layer protocols and routing algorithms. Concepts based on these algorithms/protocols should be asked in theory exam.