

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, Bluetooth, Data Link Layer Switching
- 5. The Network Layer** [15%]
Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Concept of Quality of Service
- 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

Other Reference Book (Theory):

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

Chapter Wise Coverage from Text Book:

Chapter #	Topics / Subtopics	# of Lectures
1.	1.1, 1.2, 1.3, 1.4.1, 1.4.2, 1.4.3	3
2.	2.1.3, 2.2, 2.3, 2.4.1, 2.4.4, 2.5.1, 2.5.3, 2.5.5, 2.6, 2.7	12
3.	3.1, 3.2, *3.3, *3.4	6
4.	4.1, 4.2.2, 4.2.6, 4.3 (except 4.3.5, 4.3.9, 4.3.10), 4.4, 4.5, 4.6.1, 4.6.2, 4.6.3, 4.6.7, 4.7.5	9
5.	5.1, * 5.2.1 to 5.2.5, 5.2.9, 5.2.10, 5.3, 5.4.1	5
6.	6.1.1, 6.1.2, 6.2.1, 6.2.2, 6.2.3	3
7.	7.1, 7.2.1 to 7.2.5 (except 7.2.3)	3
8.	8.1, 8.2, 8.3.1, 8.4.1, 8.4.2, 8.4.3	7
	Total # of Lectures	48

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