GUJARAT TECHNOLOGICAL UNIVERSITY

Master in Computer Application
Year II – (Semester-IV) (W.E.F. January 2017)

Subject Name: Basic Computer Science 3 – Computer Networking

Subject Code: 3640002

1. **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

2. **Prerequisites:**
   C Programming, Basic Knowledge of Linux OS, Java Programming (Core Java)

3. **Course Contents:**

Unit No.	CourseContent	%age	No of Lectures
1	**Introduction to Computer Networks** Need to share resources, Concepts of Layering, Distributed System and Networks, Prerequisites, Definition, Categories and Components, Connections, Layers and Services, Applications of Computer Networks, Data Communication Fundamentals-Introduction, Frequency and Band, Analog and Digital Signals and Transmission, Coding Mechanism, Modulation, Multiplexing and De-multiplexing, TDM, FDM, Switching and Routing, Transmission and Errors	20%	10
2	**Physical Layer** Introduction, Duties of Physical Layer, Infrared and Millimeter Waves, ISM Bands, Optical Lights and Free Space Optics, Wired Physical Layer, Wireless Physical Layer	20%	08
3	**The Data Link Layer** Duties of Data Link Layer, The Error, The Protocols	10%	05
4	**The Medium Access Sub layer** Introduction, Wired MAC Layer, The LLC Layer, Wireless MAC, The MAC Layer, The Generic Frame Structure, Connecting Device at Data Link Layer, Virtual LAN	15%	08
5	**The Network Layer**	15%	06

	Introduction, Duties of Network Layer, Connection Oriented Forwarding using Virtual Circuits, Connection Less Forwarding using Datagram, Connection Oriented Vs Connectionless Forwarding, Forwarding Examples, Routing Algorithms, Congestion, Network Layer Switching		
6	**The Transport Layer** Introduction, Duties of Transport Layer Connection Management at Transport Layer, Congestion Control, Comparison with Data Link Layer	**10%**	**04**
7	**The Application Layer** Introduction, Domain Name System: Name Space, Registration Process, Name Servers, Resource Records, Types of Resource Records, Dynamic DNS, WWW and HTTP, Bluetooth	**10%**	**04**

Text Book (Theory):

1. Bhushan H Trivedi ,"Computer Networks", Oxford University Press

Other Reference Book (Theory):

1. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, Fourth Edition
2. Andrew S. Tanenbaum, "Computer Networking", Prentice Hall, Fourth Edition

Chapter Wise Coverage from Text Book:

Unit	Topics/ .subtopics
1	1.1,1.2.1,1.2.2,1.2.3,1.2.4,1.2.5,1.2.6,1.2.7,1.2.8.1.2.10,1.3 2.1 to 2.4 3.1, 3.2, 3.3,3.4, 3.5, 3.6, 3.8,3.9,3.10,3.11, 3.12
2	4.1 to 4.7.10
3	5.1.1 to 5.1.2, 5.2.1 to 5.2.11, 5.3.1 to 5.3.10
4	6.1 to 6.6, 6.8, 6.11
5	7.1 to 7.7,7.11, 7.12
6	8.1 to 8.5
7	9.1, 9.2.1 to 9.2.5, 9.3.1 to 9.3.9, 9.12.1 to 9.12.8

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