

NATIONAL INSTITUTE OF TECHNOLOGY, JAMSHEDPUR
JHARKHAND-831014
Department of Electronics and Communication
Autumn Semester 2020
COURSE HANDOUT

Course Code: EC4103 (M.Tech 1st Sem Com. Sys. Engg.- 2020 Batch)

Course Title: Computer Communication Networks

Credit: 04

Instructor: Dr. Prashant Kumar

Computer Communication Networks – Course Outcomes	
CO1	Students will describe the significance of Computer Communication Networks
CO2	Students will describe the working and basic applications Computer Networks
CO3	Students will understand the different type of networks, protocols and reference models
CO4	Students will understand high speed networks, addressing and routing techniques

Syllabus

Unit 1

Layered tasks, OSI Model, Layers in OSI model, TCP/IP Suite, Addressing, Telephone and cable networks for data transmission, Telephone networks, Dial up modem, DSL, Cable TV for data transmission. Framing, Flow and error control, Protocols, Noiseless channels and noisy channels, HDLC.

Unit 2

Random access, Controlled access, Channelization Wired LAN, Ethernet, IEEE standards, Standard Ethernet, Changes in the standards, Fast Ethernet, Gigabit Ethernet, Wireless LAN IEEE 802.11

Unit 3

Connecting LANs, Backbone and Virtual LANs, Connecting devices, Backbone Networks, Virtual LANs Network Layer, Logical addressing, Ipv4 addresses, Ipv6 addresses, Ipv4 and Ipv6 Transition from Ipv4 to Ipv6.

Unit 4

Delivery, Forwarding, Unicast Routing Protocols, Multicast Routing protocols

Unit5

Transport layer Process to process Delivery, UDP, TCP, Domain name system, Resolution.

Reference:

1. Andrew S Tanenbaum, "Computer Network", PHI.
2. Dimitri Bertsekas & Robert Gallager, "Data Network", PHI.
3. Gilli Wates, "Computer Communication Network", McGraw- Hill.
4. William Stallings "Data & Computer Communications", 6th Edition, Pearson Education (2004).
5. Fayez Gebali, "Computer Communication Networks, Analysis and Design, 3rd Ed., North Star Digital Design, Inc., (2005).

Scope:

The students will be able to

- explain and characterise different computer networks.
- understand the function of different hardware and software units in computer communication

At the end of the course the students will be able to design specific computer networks.

Objectives:

This course will provide a sound understanding of networking.

It will help students in applying the basic knowledge of electronics in understanding modern computer networks, design specific networks and optimize the performance of such networks.

Lecture Plan

Lecture no.	Learning objectives	Topics to be covered
1-2	Basic computer networks revision	Review of LAN, MAN, WAN, Internet
3	Layered architecture	OSI Reference Model
4	Evolution of Layered architecture	TCP/IP Reference model
5-6	Data framing	Different framing structures and a comparative study
7	Physical Layer electronics communication	Wired, optical, satellite and wireless communication techniques
8	Data link layer techniques	Error control techniques
9	Access techniques	Random access, Controlled access
10-11	Electronics of Computer Networks	Physical layer issues in computer networks
12-13	IEEE Standards	Different standards in computer networks and their evolution
14	Backbone Networks	Addressing techniques and interconnections
15	Routing techniques-I	Unicasting

16	Routing techniques-II	Multicasting
17	Transport layer	P-2-P delivery, UDP/datagram
18	Domain Name System	DNS
19	Network Layer Algorithms	An introduction to Graph theory
20	Transport Layer optimization	Resolvers