

| COURSE CODE | COURSE TITLE | L | T | P | C |
|-------------|-------------------|---|---|---|---|
| 1153IT101 | COMPUTER NETWORKS | 3 | 0 | 0 | 3 |

Course Category:

~~Foundation (0) / Program Core (1) / Program Elective (2) / Allied Elective (3) / University Elective (4) / Value Education Elective (5) / Independent Learning (6) / Industry Higher Learning Institute Interaction (7).~~

a. Preamble:

This course ,Computer Networks , provides an introduction to the basic concepts of networks, layers ,Topologies, Types of networks ,Error correction and detection ,different applications that use of computer networks , different types of relationship between standards bodies and technology.

b. Prerequisite Courses:

- Principles of Data Communication
- Data Structure.

c. Related Courses:

- Network Programming.
- Information Security.

d. Course Educational Objectives:

Students undergoing this course are expected:

- To understand the concepts of data communications.
- To study the functions of different layers.
- To introduce IEEE standards employed in computer networking.
- To make the students to get familiarized with different protocols and network components.

e. Course Outcomes:

Upon the successful completion of the course, students will be able to:

| CO Nos. | Course Outcomes | Knowledge Level (Based on revised Bloom's Taxonomy) |
|---------|--|---|
| CO1 | Design various networking layers | K2, S3 |
| CO2 | Explain various modes of communication and devices | K1, S3 |
| CO3 | Explain Error detection and Error control , and types of data transmission formats | K1, S3 |
| CO4 | Illustrate various switching formats and connecting services | K1, S3 |
| CO5 | Apply various protocols and explain about their applications | K3, S3 |

f. Correlation of COs with POs :

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | M | | | | | M | | | | | | |
| CO2 | M | | | | | M | | | | | | |
| CO3 | M | | | | | M | | | | | | |
| CO4 | M | | | | | M | | | | | | |
| CO5 | M | | | | | M | | | | | | |

H- High; M-Medium; L-Low

g. Course Content:

UNIT I Introducion

L – 9

Data Communication: Data Communication system components - Network Models - OSI Model - TCP/IP Protocol Suite - Addressing - Data and Signals - Analog And Digital - Transmission Impairment - Data rate and Channel capacity – Performance.

UNIT II Physical Layer

L – 9

Digital Transmission - Digital-To-Digital Conversion - Analog Transmission - Digital-To-Analog Conversion - Transmission Media - Guided Media - Unguided Media: Wireless - Wired LANs: Ethernet - Token ring - Connecting Devices – Switching techniques.

UNIT III Data Link Layer

L – 9

Link Layer: Types of errors –Error detection- VRC, LRC, CRC techniques - Data Forward and backward error correction - Hamming code. Flow control: stop and wait-sliding window protocol, Error control: Stop and wait ARQ- Go-Back-N ARQ- Selective Repeat ARQ Protocols- Asynchronous and Synchronous Protocol - HDLC frames.

UNIT IV Network layer

L – 9

Logical Addressing - IPv4 Addresses - IPv6 Addresses - Address Mapping – ARP – RARP, BOOTP, and DHCP – ICMP - Unicast Routing Protocols - Intra- and Interdomain Routing - Distance Vector Routing - Link State Routing.

UNIT V Transport Layer and Application Layer

L – 9

Process-to-Process Delivery: UDP – TCP - Congestion Control - Quality of Service - Techniques to Improve QoS – Application layer protocols : REMOTE LOGGING - TELNET -ELECTRONIC MAIL – DNS – SMTP – FTP - HTTP .

TOTAL: 45 periods

h. Learning Resources

i. Text Books :

1. Behrouz Forouzan, "Data Communication and Networks", McGraw Hill, 2007.
2. Andrew S. Tanenbaum , Computer Networks, Prentice Hall of India, 2008.
3. S. Keshav, An Engineering approach to computer networking, Addison Wesley, 2000.

ii. Reference:

- James F. Kurose and Keith W. Ross Pearson "**Computer Networking: A Top-Down Approach**" Addison-Wesley, Boston MA , 2008. ISBN 0 - 321 - 49770 – 8
- Bruce A. Hallberg "**Networking: A Beginner's Guide**" McGraw-Hill / Osborne, 2003 ISBN 0 - 07 - 222563 – 7

iii. Online resources

- www.sciencedirect.com/science/journal/13891286
- www.functionx.com/networking/
- npTEL.iitm.ac.in/video.php?subjectId=106105081

<http://www.technolamp.co.in/2010/08/computer-networks-tanenbaum-powerpoint.html>