Devi Ahilya University, Indore, India Institute of Engineering & Technology				**III Year B.E. (Electronics and Telecommunication)**			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
ETR6G4	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
COMPUTER NETWORKS	**3**	**1**	**0**	**3**	**1**	**0**	**4**
Duration of Theory Paper: 3 Hours							

Learning Objectives: The content covers the different types of computer networks, the layered approach of protocol stack, its advantage, and protocols of each layer.

Prerequisite(s): Fundamental knowledge of data transmission

COURSE OF CONTENTS

Unit I

Computer network – Hardware, Software, Reference model, physical layer

Network and application, categories of network-LAN, MAN, WAN, Wireless Network, Internetwork, Reference models.– OSI,TCP/IP model and their comparison, Line configuration-point to point, multicast ,broadcast ,Network Topology – Mesh , Star ,Tree , Bus , Ring , Hybrid
Physical Layer – Shannon's maximum data rate of a channel, Transmission media – Guided as Magnetic, Twisted Pair, coaxial cable, fiber optics etc., wireless as radio wave, microwave, infrared

Unit II

Data Link Layer

Framing techniques , Error detection-correction , Multiplexing-TDM ,FDM,WDM ; switching – circuit , message , packet switching , Repeaters, Hubs , Bridges ,switches ,routers and gateways ;Data link protocols-- unrestricted simplex protocol, stop & wait , sliding window ,Go-back- n ,selective repeat, data link layer in internet

Unit III

Medium Access control sublayer

Channel allocation, Multiple access protocols – ALOHA, CSMA, CSMA /CD, collision-free protocol
Ethernet- frame format, cabling, encoding, performance, fast Ethernet, gigabit Ethernet, Broadband and wireless LAN, Bluetooth

Unit IV

Network layer

Connectionless – connection oriented service, comparison of virtual circuit and datagram subnet, Routing algorithms- shortest path , flooding ,distance vector , hierarchical routing , congestion control and prevention ,Quality of service , network layer in internet- IP protocol and IP address, IPv6, OSPF, BGP routing protocol

Unit V

Transport layer and Application layer

Elements of transport protocol, internet transport protocol-UDP / TCP protocol, performance issues-Network performance measurement, system design for better performance
Domain name system, email, world wide web- architecture, HTTP

Learning Outcome:

After completing this course the student must demonstrate the knowledge and ability to:
1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of subnetting and routing mechanisms.
7. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

BOOKS RECOMMEDED

[1] Andrew S. Tannenbaum, Computer Networks, 4/E Pearson Education, 2003 ,

[2] William Stallings ,Data and Computer Communications , 8/E Prentice Hall India, 2007

[3] Behrouz A.Forouzan , Data Communications and Networking ,4/E Tata McGraw-Hill, 2000